1990 PEST CONDITIONS - STATE REPORTS

Year	State	Title	Letter	Author
1990	MA	1990 Pest Conditions Report Worksheets	No	Charles Burnham
1990	ME	1990 Pest Conditions Report Worksheets	Yes	David Struble
1990	NH	1990 Forest Insect and Disease Conditions Report	Yes	Alfred Avery
1990	NY	1990 Pest Conditions Report Worksheets	Yes	Michael Birmingham
1990	CT	no title	Yes	Louis Magnarelli
1990	RI	1990 Pest Conditions Report Worksheets	no	unknown
1990	VT	Forest Insect and Disease Conditions, Northern Region	no	Ronald Kelley
1990	VT	Forest Insect and Disease Conditions, Southern Region	no	Barbara Burns

Key Words

browntail moth, cherry scallop shell moth, eastern tent caterpillar, fall cankerworm, gypsy moth, hemlock woolly adelgid, pear thrips, saddled prominent
beech bark disease, browntail moth, gypsy moth, hemlock looper, spruce beetle, spruce budworm, white pine blister rust
gypsy moth, oak leaftier
anthracnose, cherry scallop shell moth, elongate hemlock scale, hemlock woolly adelgid, pear thrips, red pine scale, saddled prominent
gypsy moth, hemlock looper
dogwood anthracnose, hemlock woolly adelgid, orange-striped oakworm, pear thrips, red pine scale
beech bark desease, eastern tent caterpillar, gypsy moth, maple leafcutter, pear thrips, satin moth

antracnose, gypsy moth, hemlock looper, maple leafcutter, saddled prominent, satin moth

MASS
1990

INTRODUCTION

Fiscal year 1990 proved to be a very productive and progressive year for the Bureau of Shade Tree Management and Pest Control. Bureau Tree Crews were in constant demand doing tree planting, tree removals, hazardous tree pruning and maintenance, stump grinding and emergency storm clean-up in the Department's Forest and Park facilities statewide.

Bureau personnel continue to monitor and survey the state for insect and disease outbreaks, keeping Tree Wardens, public officials, and the general public informed of current pest problems. The Bureau is also involved in various research projects cooperating with the U.S. Forest Service, the University of Massachusetts and other Northeast area states.

The U.S. Forest Service initiated a new program called "Forest Health Monitoring". This program will involve intensive data collection by Bureau Staff in Forest plots statewide.

Bureau personnel have achieved great strides in promoting and implementing the Mass. ReLEAF program, Tree City USA and Arbor Day programs.

Additional accomplishments and endeavors of the Bureau are fully explained in the following report.

Personnel

Pete Porrazzo retired as District Supervisor of the Bureau of Shade Tree Management and Pest Control after 38 years in the Department. Pete began working in the Department as a Conservation Helper, then went on to be a Tree Climber, Tree Crew Foreman and District Supervisor serving Middlesex and Essex Counties.

Due to budget constraints the Bureau was unable to replace Mr. Porrazzo in District 4 causing a void in that position.

INSECT/PEST ACTIVITIES

Gypsy Moth

Defoliation from Gypsy Moth for the Commonwealth of Massachusetts dramatically increased this year compared to last years figures of 6,618. An aerial survey conducted in July of 1990 revealed pockets of defoliation throughout the state totaling 83,595 acres. The worst defoliation occurred in Hamden, Hampshire, Franklin, Worcester and Bristol Counties.

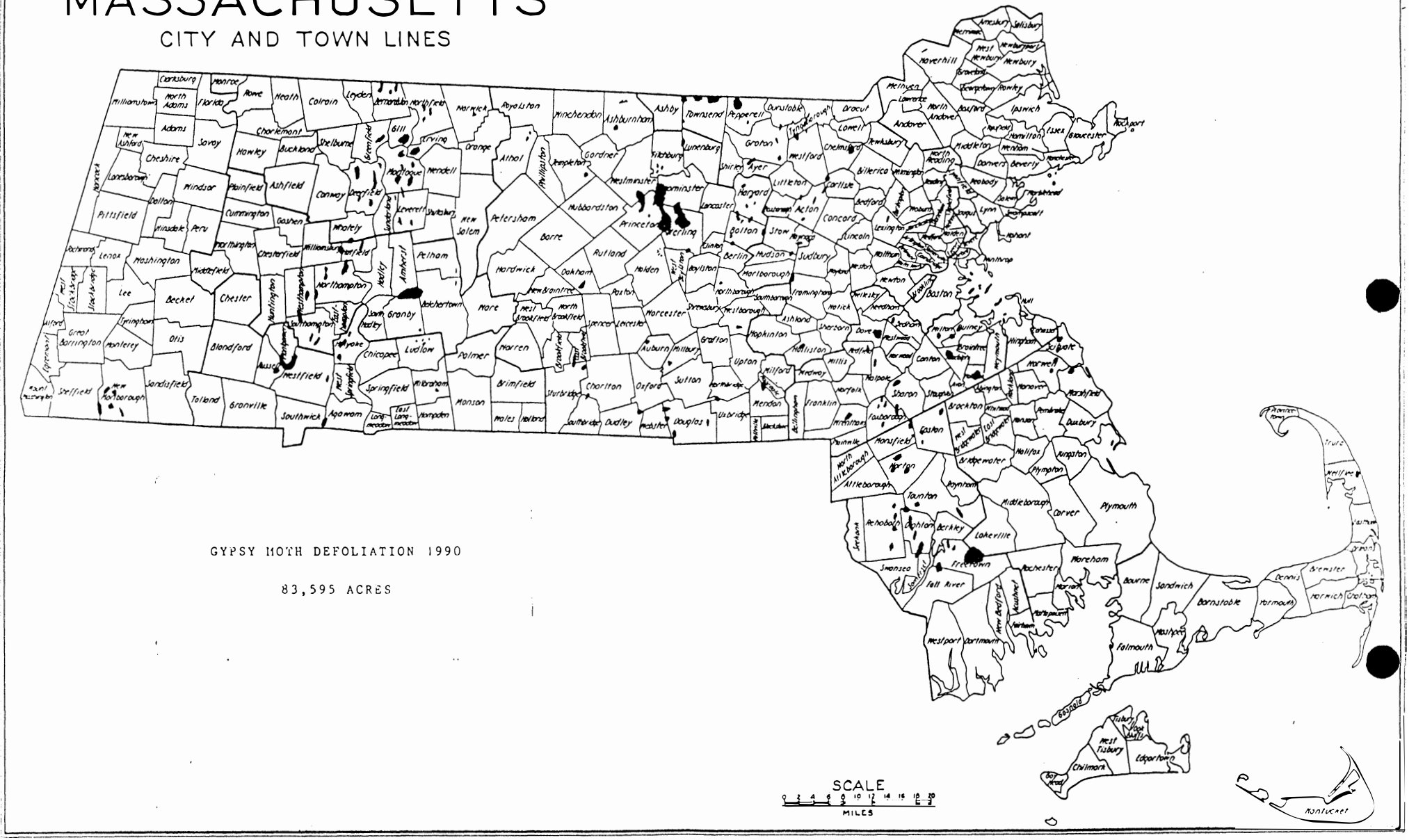
The fungus Entomophaga caused significant caterpillar mortality in all areas where gypsy moth activity occurred. Despite this there was an increase in egg mass counts in all the infested areas with the exception of Southern Worcester county. All indications point to a greater possibility that there will be an increase in visible defoliation by Gypsy Moth in 1991.

Pear Thrips

Pear Thrips, Taeniothrips inconsequens which caused serious defoliation of sugar maples in the Northeast in 1988, were present in large numbers in Berkshire, Hamden, Hampshire and Franklin Counties. As was the case last year little damage occurred from this pest. It appears the timing of insect emergence and bud development is the key factor as to how much damage pear thrips will cause. The most severe damage occurs when trees are in the bud state. It appears that Pear Thrips will continue to be a threat to sugar maples in future seasons.

MASSACHUSETTS

CITY AND TOWN LINES


Clarksburg
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Pepperell
Dunstable
Tyngsborough
Dracut
Lowell
Methuen
Lawrence
North Andover
Andover
Haverhill
Amesbury
Salisbury
Merrimac
West Newbury
Newbury
Groveland
Georgetown
Rowley
Boxford
Ipswich
Essex
Gloucester
Rockport
Hamilton
Wenham
Manchester
Beverly
Danvers
North Reading
Wilmington
Billerica
Tewksbury
Chelmsford
Westford
Groton
Shirley
Ayer
Harvard
Littleton
Carlisle
Bedford
Concord
Acton
Boxborough
Stow
Maynard
Sudbury
Hudson
Berlin
Bolton
Lancaster
Sterling
Princeton
Westminster
Gardner
Templeton
Phillipston
Winchendon
Ashburnham
Ashby
Townsend
Lunenburg
Fitchburg
Leominster
Hubbardston
Barre
Petersham
New Salem
Orange
Athol
Erving
Wendell
Montague
Gill
Greenfield
Shelburne
Buckland
Charlemont
Hawley
Heath
Rowe
Florida
Monroe
Clarksburg
North Adams
Adams
Savoy
New Ashford
Cheshire
Lanesborough
Windsor
Plainfield
Ashfield
Conway
Deerfield
Whately
Sunderland
Leverett
Shutesbury
Pittsfield
Dalton
Hinsdale
Peru
Cummington
Goshen
Williamsburg
Northampton
Easthampton
Southampton
Westhampton
Chesterfield
Worthington
Middlefield
Becket
Washington
Lenox
Richmond
Pittsfield
Lee
Chester
Huntington
Blandford
Otis
Tolland
Granville
Southwick
Agawam
West Springfield
Springfield
Longmeadow
East Longmeadow
Hampden
Wilbraham
Monson
Palmer
Warren
Brimfield
Holland
Sturbridge
Southbridge
Charlton
Oxford
Dudley
Webster
Douglas
Sutton
Auburn
Millbury
Grafton
Upton
Hopkinton
Holliston
Medway
Millis
Norfolk
Franklin
Wrentham
Plainville
Norton
Mansfield
Easton
Foxborough
Sharon
Stoughton
Canton
Milford
Bellingham
Mendon
Blackstone
Uxbridge
Northbridge
Grafton
Shrewsbury
Westborough
Ashland
Framingham
Natick
Wellesley
Needham
Dedham
Westwood
Norwood
Walpole
Medfield
Dover
Sherborn
Hopedale
Milford
Hartford
Holden
Rutland
Oakham
New Braintree
Barre
Hardwick
Ware
Palmer
Monson
Brimfield
Holland
Wales
Sturbridge
Southbridge
Dudley
Webster
Douglas
Uxbridge
Worcester
West Boylston
Boylston
Northborough
Southborough
Marlborough
Hudson
Sudbury
Wayland
Weston
Newton
Waltham
Watertown
Belmont
Arlington
Lexington
Bedford
Burlington
Woburn
Winchester
Medford
Somerville
Cambridge
Boston
Brookline
Dedham
Westwood
Norwood
Canton
Milton
Quincy
Braintree
Weymouth
Hingham
Cohasset
Scituate
Marshfield
Pembroke
Duxbury
Hanover
Norwell
Hingham
Hull
Boston
Revere
Winthrop
Chelsea
Everett
Malden
Melrose
Stoneham
Wakefield
Reading
North Andover
Andover
Lawrence
Methuen
Salem
Peabody
Lynn
Saugus
Lynnfield
Middleton
Topsfield
Boxford
Rockport
Gloucester
Essex
Ipswich
Hamilton
Wenham
Manchester
Beverly
Danvers
North Reading
Wilmington
Billerica
Tewksbury
Chelmsford
Westford
Groton
Shirley
Ayer
Harvard
Littleton
Carlisle
Bedford
Concord
Acton
Boxborough
Stow
Maynard
Sudbury
Hudson
Berlin
Bolton
Lancaster
Sterling
Princeton
Westminster
Gardner
Templeton
Phillipston
Winchendon
Ashburnham
Ashby
Townsend
Lunenburg
Fitchburg
Leominster
Hubbardston
Barre
Petersham
New Salem
Orange
Athol
Erving
Wendell
Montague
Gill
Greenfield
Shelburne
Buckland
Charlemont
Hawley
Heath
Rowe
Florida
Monroe
Clarksburg
North Adams
Adams
Savoy
New Ashford
Cheshire
Lanesborough
Windsor
Plainfield
Ashfield
Conway
Deerfield
Whately
Sunderland
Leverett
Shutesbury
Pittsfield
Dalton
Hinsdale
Peru
Cummington
Goshen
Williamsburg
Northampton
Easthampton
Southampton
Westhampton
Chesterfield
Worthington
Middlefield
Becket
Washington
Lenox
Richmond
Pittsfield
Lee
Chester
Huntington
Blandford
Otis
Tolland
Granville
Southwick
Agawam
West Springfield
Springfield
Longmeadow
East Longmeadow
Hampden
Wilbraham
Monson
Palmer
Warren
Brimfield
Holland
Wales
Sturbridge
Southbridge

HEMLOCK WOOLY ADELGID

Hemlock Wooly Adelgid (Adelges Tsugae), which was first discovered in Massachusetts last year in the forest park area of Springfield, was identified on hemlock trees in Waltham by a U-Mass entomologist. There appears to be no spread of the infestation of this pest in the Springfield area. However this insect is very difficult to survey and there is a possibility of its unknown presence in other areas of the state. Hemlock trees will require continuous monitoring to determine the prevalence of Hemlock Wooly Adelgid in the State.

CHERRY SCALLOOP SHELL MOTH

The cherry scalloop shell moth, calocalpe undulata, occurs on wild and choke cherries throughout much of eastern north america. The caterpillars live in nests which they construct by webbing together the leaves toward the end of a branch.

Rather sudden increases of these insects have caused noticeable defoliation in Worcester County and north Berkshire County a heavy infestation was reported on the M.D.C. ware river watershed property. The majority of the infestations were localized but heavy on individual cherry trees. The unusual onslaught of this.

OAK LEAF TIER - OAK LEAF ROLLER COMPLEX.

Oak Leaf tier (croesia semipurpurana) and oak leaf roller (Archips semiferanus) have been observed feeding in concert in Bristol, Norfolk, and Franklin counties. A small outbreak of these insects have been occurring in the Auburn-Oxford-Grafton area of Worcester County for the past three years with limited damage to oak stands and no apparent acceleration of tree mortality to date. Most defoliation from these insects ranging from light to moderate on individual trees and stands of trees occurred in Bristol and Norfolk counties. Oak leaf Tier populations have fallen below the level of noticeable defoliation in the Warwick area of Franklin County.

FALL CANKERWORM

The Fall Cankerworm, Aslophila pametaria, often called "inchworms" is a defoliator of various hardwood trees. This insect feeds by skeletonizing the leaves of hosts causing severe aesthetic damage to ornamental and shade trees.

After causing significant defoliation in 1989 with approximately 2,000 acres affected in Falmouth, Scituate, and Nantucket, the 1990 aerial survey shows a reduction to 800 acres spreading north from the original infestation in Falmouth.

EASTERN TENT CATERPILLAR

Eastern Tent Caterpillar (Malacosoma americanum) was noticeable present in Berkshire and Middlesex counties this year. This pest occurs sparsely statewide feeding on the foliage of various hardwood trees. The caterpillar prefer fruit trees such as

Wild Cherry, Apple, Crabapple, and others that are commonly used as ornamental in the landscape. The most KXD impact of this pest is the defoliation and unsightly silken tents that are formed in branch crotches of these ornamental which ruins the tree aesthetic appearance.

OAK SKELETONIZER

The Oak Skeletonizer, (Bucculatix ainsliella) in the caterpillar stage feeds on the surface of oak leaves leaving the veins of the leaves untouched. This insect has two or more generations per year. During the spring and early summer they often go unnoticed. However, second and third generations of this pest in late summer can cause severe damage to oak trees. Trees that sustain repeated attacks are weakened and suffer crown thinning and die-back. Occasional outbreaks of this insect in or around residential areas becomes an annoying public nuisance when the small yellowish-green caterpillars spin down from infested oak trees landing on anyone or anything underneath. Their habit of forming small, white, ribbed cocoons on almost anything including lawn furniture, window screens, etc. is also very annoying. This insect has declined since last year with only slight infestations reported in Essex and Middlesex counties.

BROWN TAIL MOTH

The Brown Tail Moth, (Euproctis chrysorrhoea) continues to be confined on the Cape Cod National Seashore in the towns of Barnstable, Wellfleet, Truro, and Providencetown. It appears this infestation remains stable in this area, the towns of Truro and the Seashore continue their attempt to reduce Brown Tail Moth

populations by hand clipping the winter nests of this pest. These insects feed mostly on bayberry. Not only are they destructive on host plants but they are also considered a health problem since some people suffer severe skin rashes after coming in contact with caterpillar hairs.

NANTUCKET PINE TIP MOTH

The Nantucket Pine Tip Moth, (Rhyacionia frustriana) attacks many species of pine by boring into the branch terminals. This insect prefers pitch, scots and other short needled pines.

This insect occurs annually on Cape Cod in Barnstable and Plymouth counties. They are particularly destructive to young trees causing growth reduction, stem deformities and prolonged stress the often results in subsequent tree mortality. Many younger trees have succumb to this pest.

PINE NEEDLE MINER

The Pine Needle Miner, (Exoteleia pinefoliella) causes severe browing and subsequent defoliation of pine trees. The injury from this pet, which often occurs on trees also infested by the Nantucket pine tip moth, is particularly noticeable along major highways leading to Cape Cod. Heavy defoliation from this insect was reported along Route 3 in Plymouth. Various degrees of defoliation occur annually in Plymouth and Barnstable counties causing much public concern.

FALL WEBWORM

The Fall Webworm, (Hyphantria Cunea) was noticeable prevalent this year throughout Middlesex and Southern Worcester counties. Although this insect is not considered a threat to host trees since

it feeds on the foliage late in the growing season, it often causes public attention due to the unsightoly large webs it creates, particularly in the home landscape.

SADDLED PROMINENT

The Saddled Prominent, (Heterocampa guttivitta) defoliates hardwood trees, preferably beech, birch and maple from late July through early September. Significant damage was noted in large areas in Northern Berkshire and Hampshire counties in late July and early August. However, it appears that the majority of the population of this pest collapsed before any severe defoliation occurred. It is thought that either the same Entomophaga fungus that affected gypsy moth or a similar form of the fungus is responsible for the collapse of these insects. The areas affected by this pest will be monitored closely in 1991.

FOREST AND SHADE TREE DISEASE

All trees that are susceptible to leaf diseases most likely showed symptoms of infection due to the cool wet spring weather and moist growing season.

ANTHRACNOSE

Anthracnose diseases were very prevalent on a variety of susceptible hosts. Anthracnose diseases are caused by several types of fungi which cause spotting, browning and distortion of leaves and in some cases twig and branch dieback. Most american sycamores were completely defoliated this season from anthracnose. Anthracnose on dogwood often results in tree mortality. Other trees affected by anthracnose include oak, maple and ash.

ASH DECLINE/ASH YELLOWS DISEASE

Continues to plague ash trees throughout the state and the Northeast. Ash mortality is very noticeable in urban and rural forests. Several municipalities are losing mature ash shade trees resulting in increased tree removal costs. White ash appears to be more susceptible to the disease. Several factors may cause the decline but recent research has shown that a myco-plasma like organism (MLO) is a primary casual agent for ash decline and subsequent mortality.

SUGAR MAPLE DECLINE

Continues to be monitored throughout Berkshire, Hamnpshire and Franklin counties. This decline complex is the focus of on-going cooperative research between this department, the U.S. Forest Service and the University of Massachusetts. Forest and shade trees are affected, although there is a different combination of stress factors involved.

HORSE CHESTNUT LEAF BLOTCH

Horse Chestnut Leaf Blotch, which is caused by the Fungus Guignardia aesculi, was very noticeable wherever these trees have been planted. This disease caused severe browning of foliage and early leaf drop on horse chestnuts planted as street trees or in the landscape.

PINE TIP BLIGHT

Pine Tip Blight caused by the fungus Pinea diplodia has been prevalent in Marthas Vineyard State Forest for several years and has virtually killed out the majority of red pine in the forest.

Regeneration of other tree and shrub species is starting to occur in this area.

SHADE TREE MANAGEMENT ACTIVITIES

D.E.M. FACILITIES

The Department's forests and park facilities are observed regularly by the Bureau's District supervisor to determine shade tree management needs within those facilities. District Supervisors also respond to the requests for arboricultural services from Park Supervisors which are prioritized in the Regional office. It is our responsibility to make sure the department's forests and park facilities are free of potentially hazardous trees in areas accessible to the public.

During F.Y. 90 the Bureau's tree crews provide arboricultural services at 599 forest and park facilities statewide. These facilities include state forests, state parks, heritage state parks, fire towers regional offices, swimming pools and skating rinks.

A variety of services are provided at these facilities including tree removals, tree pruning, tree planting, poison ivy control, weed control, insect and pest surveys, insect control, hazard tree surveys, utility line clearance, stump removals, vista pruning and site clearance.

ASSISTANCE TO OTHER AGENCIES:

The Bureau's District Supervisors and Tree Crews often receive requests from other state and federal agencies to provide arboricultural services and technical information.

During F.Y. 90 the Bureau provided assistance to the following agencies.

Department of Mental Health

Mass. Dept. of Public Works

Metropolitan District Commission

Belchertown State School, Civil Defense

Mass. State Police

Quinsigamond Community College

Worcester County 4-H Camp

Rutland State Hospital

University of Massachusetts - Amherst

Department of Education

University of Mass. - Lawrence Labs

Northampton State Hospital

North Adams State College

Berkshire Community College

MUNICIPAL ASSISTANCE

Bureau personnel are also responsible for providing technical assistance to municipal Tree Wardens and other public officials. Bureau Chief and District Supervisors often visit cities and towns providing public officials with technical information regarding diagnosing insect and disease problems of forests and shade trees, surveying insect populations, determining pest control strategies, identifying potentially hazardous trees, instruction of proper arboricultural practices, and developing and implementation shade tree inventories and management plans.

Tree crews also provide emergency assistance to the town of Princeton following a severe storm that whipped through northern Worcester County. The storm had tornado like winds that downed many tree and power lines and blocked roads throughout the town. The crew assisted in the storm damage cleanup by clearing town roads so that power lines could be restored and emergency vehicles could pass by.

Bureau personnel also participated in municipal Arbor Day programs, presented Tree City USA awards to qualifying communities and promoted the Mass. ReLEAF Grant Program (see special projects).

EDUCATIONAL PROGRAMS - ATTENDED

Throughout the year Bureau personnel attended and participate in a variety of educational seminars, workshops, conferences, and field related association meetings. It is important for employee career development and professionalism

The Bureau's District Supervisors attended the annual meeting

of the Massachusetts Tree Warden and Foresters' Association February 6-7, 1990. Assistant Bureau Chief Ernest DeRosa has served as program chairman for this conference for the past six years. Bureau Staff also attended the annual meeting of the Tree Warden's Arborists', and Utilities Conference March 13-15, 1990.

Both of these meetings are historical in nature in Massachusetts dating back to the early 1900's. They provide attendees the opportunity to hear the most-up-to-date information in the tree care profession plus the chance to interact with other professional from all aspects of the industry. Other meetings attended by Bureau Staff include: National Gypsy Moth Review, Annapolis, MD; Fourth Urban Forestry Conference, St. Louis, Mo; Pear Thrips Conference, Burlington , Vt; Gypsy Moth Control Materials Program, White River Jet, Vt; Gypsy Moth Research Meeting, Windsor, Ct; Northeast Forest Pest Council Meeting, Albany, N.Y.; New England Forest Health Monitoring Training, Northwoods, N.H.; New England Chapter International Society of Arboriculture. Hazardous Materials Training Seminars; Birch Leaf Miner Survey Training Workshop; Lyme Disease Seminars; Lakes and Ponds Training Seminars; Pesticide Workshops.

EDUCATIONAL PROGRAMS - CONDUCTED

Bureau Chief, Assistant Chief and District Supervisors are also involved in conducting educational programs for Tree Wardens, Public officials, DEM Park Supervisors and Staff, Professional groups and associations, and the general public. During FY 90, the Bureau as a whole conducted 20 educational seminars to approximately 1050 attendees. These programs covered various

topics such as Tree City USA, MA ReLEAF, Chain Saw Safety, Lyme Disease Identification & Prevention, Tree Insects and Disease, Urban and Community Forestry, Proper Tree Care Practices and other Shade Tree Management and Pest Control Activities.

LYME DISEASE

Lyme Disease is a bacterium known as Borrelia Burgdorferi. This disease is carried in the bodies of deer ticks (Ixodes Dammini), which can transmit the disease to humans by biting and attaching to bodily parts. An increase of human cases diagnosed as Lyme Disease in the Northeast has warranted more attention within the Department's Forest and Parks system. A management plan that began in 1987 continues to monitor and control Lyme Disease in two areas where deer ticks appear to be most prevalent, those being Scusset State Beach and Nickerson State Park.

The dispersal of Damminix tubes were effective to the point of reducing the number of ticks collected in the post survey. Other methods being initiated by the Department will be the placement of signs in strategic locations throughout the areas. These signs will define the precautions to be taken to avoid the possibility of contracting Lyme Disease. Handouts with the Departments logo containing similar information are being distributed to campers checking into sites at these locations.

ARBOR DAY PROGRAMS

Arbor Day was held April 28, 1989, with all D.E.M. Arbor Week activities taking place April 15 - April 30, 1989. All Arbor Day activities were coordinated through the Bureau of Shade Tree Management and Pest Control.

STATEWIDE

Arbor Day falls on the last friday in April in Massachusetts, this year being April 27, 1990. Various Arbor Day activities at D.E.M. Forest and Park facilities took place during late April and early May. DEM personnel also participate in several state and municipal Arbor Day events. All Arbor Day activities were coordinated through the Bureau of Shade Tree Management and Pest Control. The Bureau distributed 16,000 fir, spruce and white pine seedlings statewide.

REGIONAL ARBOR DAY PROGRAMS

Region I

*Arbor Day Program Facility - Henry T. Wing School

Date - April 27, 1990

Quantity of Seedling requested - 400

* Arbor Day Program Facility - Heritage Chrisitian School

Date - April 20, 1990

Quantity of Seedling requested - 600

*Arbor Day Program Facility - Otis Air Force Base

Date - April 28, 1990

Quantity of Seedling requested - 150

*Arbor Day Program Facility - Middleboro School System N. District

Date - April 27, 1990

Quantity of Seedling requested - 250 + 500 - 1 Sapling tree

*Arbor Day Program Facility - Nickerson State Park

Date - May 1, 1990

Quantity of Seedlings requested - 175

*Arbor Day Program Facility - Friends Acadamy

Date - April 19, 1990

Quantity of Seedling requested - 65

*Arbor Day Program Facility - Darthmouth Childrens Museum

Date - April 20, 1990

Quantity of Seedling requested - 500 + 1 Sapling Tree

*Arbor Day Program Facility - N. Attleboro Elementary School

Date - April 25, 1989

Quantity of Seedling requested - 100

*Arbor Day Program Facility - Westport Elementary School

Date - April 29, 1989

Quantity of Seedling requested - 107 + 1 Sapling

*Arbor Day Program Facility - Fall River Hertiage S.P.

Date - April 22, 1990

Quantity of Seedling requested - 800

*Arbor Day Program Facility - Borderland State Park

Date - April 27, 1990

Quantity of Seedling requested - 250

*Arbor Day Program Facility - Foxboro State Forest

Date - April 27, 1990

Quantity of Seedling requested - 100

*Arbor Day Program Facility - Stoney Brook Reservation - Norfolk

Date - April 26, 1990

Quantity of Seedling requested - 50

Region II

*Arbor Day Program Facility - Visits to selected schools in district

Date - April 27, 1990

Quantity of Seedling requested - 600 plus

*Arbor Day Program Facility - Halibut Point State Park

Date - April 27, 1990

Quantity of Seedling requested - 200

*Arbor Day Program Facility - Elm School Ashby

Date - April 1990

Quantity of Seedling requested - 400

*Arbor Day Program Facility - Henry Warren School Ashland

Date - April 27, 1990

Quantity of Seedling requested - 400

*Arbor Day Program Facility - Hopkinton Center School K-3

Date - April 26, 1990

Quantity of Seedling requested - 700

*Arbor Day Program Faciity - Shade Tree Mgmt. & Pest Ctrl Stow

Date - April 1990

Quantity of Seedling requested - 50

*Arbor Day Program Facility - Mack Buildin

Date - April 22,23, 1990

Quantity of Seedling requested - 500 + 5 sapling

*Arbor Day Program Facility - Lawrence Heritage State Park

Date - April 27, 1990

Quantity of Seedling requested - 600

*Arbor Day Program Facility - Great Brook Farm State Park

Date - April 20, 1990

Quantity of Seedling requested - 130

*Arbor Day Program Facility - Maudslay State Park

Date - April 28, 1990

Quantity of Seedling requested - 500

*Arbor Day Program Facility - Bradley Palmer

Date - April 27, 1990

Quantity of Seedling requested - 150

*Arbor Day Program Facility - Walden Pond

Date - April 27, 1990

Quantity of Seedling requested - 200

*Arbor Day Program Facility - Cochituate State Park

Date - April 21, 1990

Quantity of Seedlng requested - 500 + 5 Sapling

Region III

*Arbor Day Program Facility - Gardner Hertiage State Park

Date - April 28, 1990

Quantity of Seedling requested - 350

*Arbor Day Program Facility - Worcester Parks Dept., Elm Park

Date - April 28, 1990

Quantity of Seedling requested - 2,000

Region IV

*Arbor Day Program Facility - Belchertown State School

Date - Early May

Quantity of Seedling request - 0 + 1 Sapling

*Arbor Day Program Facility - Elementary School

Date - April 27, 1990

Quantity of Seedling requested - 300 + 1 Sapling

*Arbor Day Program Facility - Hatfield Elementary School

Date - April 27, 1990

Quantity of Seedling requested - 150 + 1 Sapling

*Arbor Day Program Facility - Town of Amherst

Date - April 27, 1990

Quantity of Seedling requested - 86

Region V

*Arbor Day Program Facility - Sheffield Center School

Date - April 27, 1990

Quantity of Seedling requested - 300

*Arbor Day Program Facility - Sturbridge Elementary School

Date - April 27, 1990

Quantity of Seedling requested - 350 + 1 Sapling

*Arbor Day Program Facility - Clarksburg Elementary School

Date - April 27, 1990

Quantity of Seedling requested - 300

SPECIAL PROJECTS

PEAR THRIPS

An attempt is being made thru funding to UMASs by DEM to determine if pear Thrips colonize and reproduce better on trees which are of low vigor. The method for determining a tree vigor is by analyzing the amount of starch reserves stored in the tree roots. Root samples were collected from 7 sites and the results were supplied to UMASS for site and tree selection. Five Sites were selected (New Salem 2, Worthington 1, and Chesterfield 1). At each site cages were placed over the branch tips by the STM&PC crew prior to thrips emergence. At a later date insects were collected and a known number were released within the cages. After the thrips feeding and egg laying was complete the case and branch tips were clipped and returned to UMASS for analyzation and data collection. UMASS is to prepare a report on the results.

GYPSY MOTH MONITORING AND FOCI

In Cooperation with UMASS the 20 Gypsy Moth plots in each district were again checked, burlaps replaced where needed and traps installed. In September the number of pupae and egg masses were counted, the trap retrieved and all data collected was given to Dr. Elkinton of UMASS.

FOCI

It was decided early in 1990 that the attempt to control a Gypsy Moth population in hot spots (foci) would not be attempted. This is a result of the funding to UMASS ending and if a pesticide application was made several more years would be needed to monitor

results, and also because of the problems in getting an aerial applicators was experience in 1988. However the plots are being maintained on Sawmill Hill (Northampton), and on Country and Dry Hill (Wendell) to continue to monitor the insects population. This is being done without assistance from UMASS.

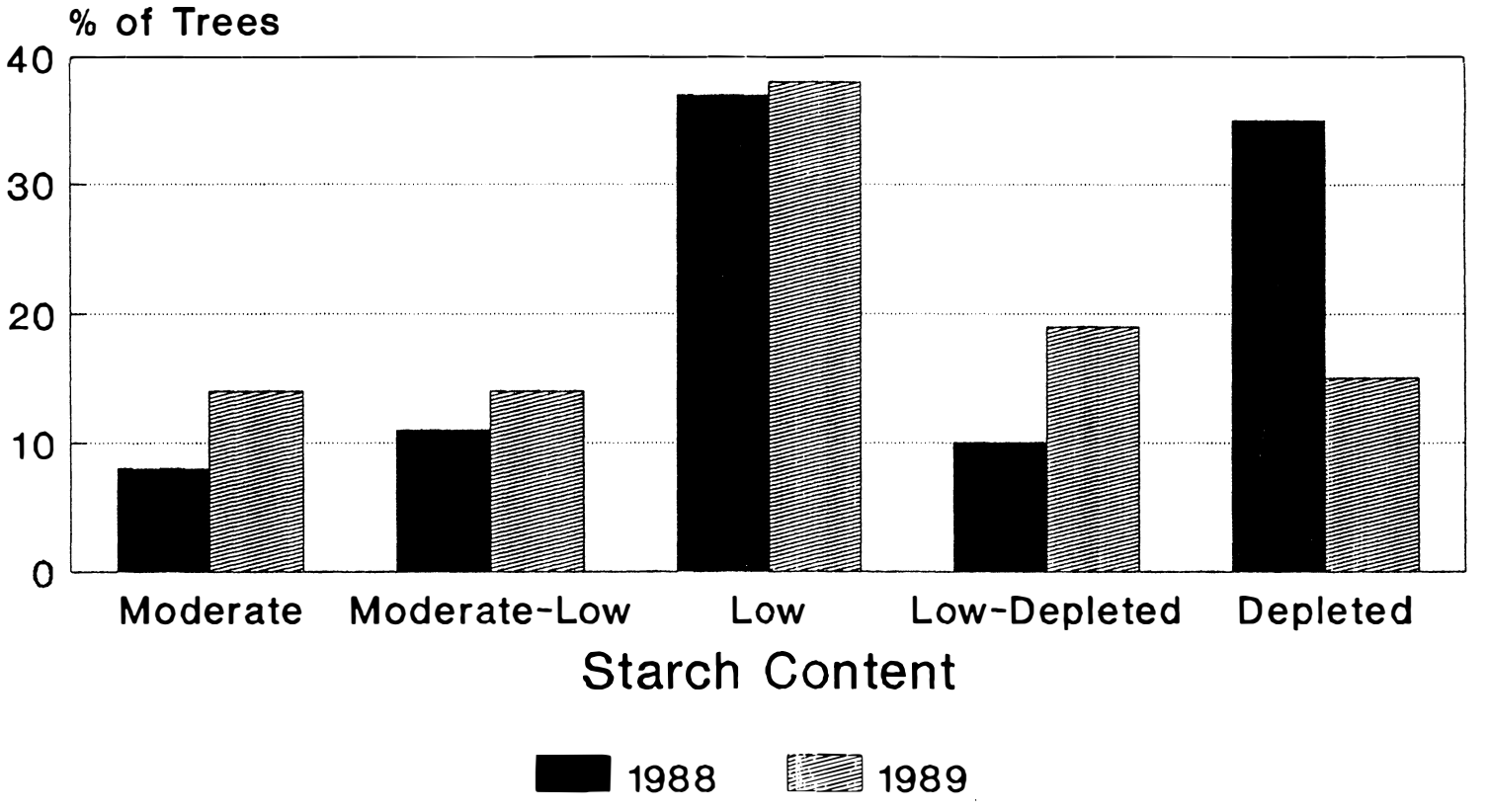
SUGAR MAPLE ROOT STARCH

In 1988 the Sugar Maple stands in Western Massachusetts were severely defoliated by the Pear Thrips. To determine the affects this defoliation on the vigor of the Sugar Maples, root starch data was collected from trees within the North American Sugar Maple Decline Project. The results of this was reported in the FY 89 annual report. Since no defoliation was noted in 1989 it was decided t repeat the process and sample 226 of the same trees. This is slightly less trees than in 1988 but this was done because of time constraints and an increase in workload from other projects. When the results were analyzed it was determined that 42% of the trees had an increase in root starch thus increased vigor while 32% decreased with 26% remaining the same. This would lead to believe that trees which are not stressed by repeated defoliations will start to recover the following season. The attached graph compares the two year results by starch contents. At the present time there are no plans to continue this project in fall of 1990

STARCH CONTENT

Sugar Maple

(Defoliated 1988)



C. Burnham 3/90

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FOREST HEALTH MONITORING

Each Bureau Supervisor attended a seminar in New Hampshire for five days on Forest Health monitoring. The program was presented by the US Forest Service in cooperation with the Northeastern States. The program instructed each individual on the use of Forestry related equipment, compass, hand held data processors and computers, aerial photos, plot set ups, tree measuring devices, etc. Upon completion, this information was put to use to set up designated plots across the State to determine the forest health conditions over the next several years.

LYME DISEASE- DAMMINIX TREATMENT

The deployment of Damminix tubes at Scusset Beach State Reservation and Nickerson State Park was carried out again this year. The tubes were put out by Campers and host families and some park personnel at Scusset. At Nickerson the tubes were put out by STM&PC District Supervisor Dick Kelliher, Fire personnel and one host family. I believe this is the last year for this program. Next year more emphasis will be placed on public notification and information regarding precautions to be taken by the user public against the deer tick which spreads Lyme Disease.

BIRCH LEAF MINER SURVEY - U OF MASS

Working with the Entomology Department of University of Mass. Each District Supervisor was instructed to find 20 pots in 5 towns each with the emphasis on gray and white Birch Trees. Each tree was randomly sampled by collecting leaves for each. Visual diagnosis of each leaf was recorded for Birch Leaf Miner. This information was then transferred to the University of

Massachusetts.

YANKEE FOREST COOPERATIVE PROGRAM

District Supervisor Russell Larson continues to be involved with the Insect and Disease Subcommittee of the Yankee Forest Cooperative Project, a Tri-STate Forestry initiative between Massachusetts, Connecticut and Rhode Island., Three aerial surveys were conducted to determine areas of highest mortality in oak stands resulting from repeated Gypsy Moth Defoliation. The Committee designated the highest percent mortality area as the Y.F>C>P> Site Conversion Demonstraton Area. A proposal was submitted to the Management Forester in the Southern Worcester County to initiate a salvage cut and site conversion project.

TREE CITY USA PROGRAM

The Bureau represents our State Forester's Office in the promotion and implementation of the Tree City USA award program which is sponsored by the National Arbor Day Foundation. This award gives national recognition to cities and towns across America that have made special commitment to the planting and care of trees in their communities.

This year seven more communities have been recognized as Tree City USA's in Massachusetts to twenty-seven.

Bureau personnel presented Tree City USA plaques and flags to qualifying communities in conjunction with their local Arbor Day events.

Those Massachusetts communities that received Tree City USA Awards this year are as follows:

Sharon	Year 4	Lynn	Year 1
S. Hadley	Year 4	Natick	Year 6
Danvers	Year 6	Acton	Year 6
Manchester	Year 7	Wayland	Year 4
Springfield	Year 4	Wellesley	Year 7
Reading	Year 5	Framingham	Year 5
Lexington	Year 6	Worcester	Year 5
Belmont	Year 5	Amherst	Year 6
Glouster	Year 3	Easton	Year 2
Hanscom AFB	Year 3	Hingham	Year 2
W. Springfield	Year 4	Cambridge	Year 1
Watertown	Year 1	Plymouth	Year 1
Sturbridge	Year 1	Newton	Year 1
W. Boylston	Year 1		

MASS. ReLEAF

On April 28, 1989, Governor Michael S. Dukakis and Environmental Affairs Secretary John DeVillars announced a new state policy encouraging the planting and care of shade trees as a means of combating global warming, conserving energy and improving the quality of life for the Commonwealth's residents. Dubbed "Mass. ReLEAF", this program solicits donations to pay for the planting of shade trees in the state's cities and towns. The money will be distributed to communities through a competive grant program administered by the Department of Environmental Management. Any community that has a tree warden and a budget for the planting and care for shade trees is eligible.

A Mass. ReLEAF Grant Application was mailed out to every Tree Warden and Mayor (or equivalent) in all 351 cities and towns in the Commonwealth. To our surprise 93 communities responded with grant proposals totaling $568,000. Since the program had just begun there was limited funding that allowed the Bureau to partially fund 25 community tree planting projects.

As more funds become available we are optimistic that a significant amount of trees will get planted in our Massachusetts communities through the Mass. ReLEAF program.

OAK LEAF TIER

In an effort to keep track of this insects populations 15" branch samples were collected from the known area of infrestation. These were examined under a microscope for the presence of insect eggs. The results of this sampling indicates that the insect population has fell below the level of noticeable defoliation. It is questionable if the collapse of this insect's population could have been caused by a species of the Entomophaga fungi which also was proven to effect the Gypsy Moth and Saddle Prominent populations. We will continue to monitor this insect in 1990.

FOURTH URBAN FORESTRY CONFERENCE

The conference was attended by the district supervisor Joseph Lokitis. The 1989 conference was hosted by the City of St. Louis, Missouri. This city was chosen because of its central location, active Urban Forestry program, and ideal conference setting located on the edge of the Arch grounds, a beautiful downtown greenway, and the Mississippi River.

The theme of the conference "Make our Cities Safet for Trees" was chosen because it has been discovered that trees offfer more than just shade, they work to lower health costs, to replace the need for more power plants, to cleanse the urban environment and reduce global warming. All these facts point to the need to make more space for trees and to make our communities safe for trees.

The conference speakers were chosen for their knowledge ona variety of subjects pertinent to urban forestry. The themes of the sessions were "Trees as the Centerpiece of Tomorrow's Cities and Towns", "Social and Psychological Values", "Energy and

Environment", "Making Cities for Trees", and "Making a Place for Trees".

A municipal tour was taken to observe the results of the new planting campaign in St. Louis and also a drive through Forest Park with stops at St. Louis Zoo, Clayton, University City and Anheuser Bush corporate headquarters.

MA.

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Gypsy Moth

(SPECIFIC NAME): Lymantria dispar

HOST: Oak

PRESENT CONDITION:

AREA (TOTAL ACRES): 83,597 Acres

LOCATION: Berkshire, Hampden, Hampshire, Franklin Worcester, and Bristol Counties

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION;DEFINE CLASSES):
20,496 acres of moderate defoliation
63,101 acres of heavy defoliation

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

TREND:

PAST TO PRESENT: There was a dramatic increase in 1990. Scattered pockets of moderate to heavy defoliation in the infested counties

FUTURE: Egg mass counts indicate a potential for an increase in defoliation in 1991.

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

COMMENTS: There was a high degree of mortality from Entomophaga in 1990. It is unknown what effects this will have on future populations.

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Cherry Scallop Shell Moth
(SPECIFIC NAME): Calocalpe undulata

HOST: Pin and Black Cherry

PRESENT CONDITION:

AREA (TOTAL ACRES): 450 Acres

LOCATION: Worcester and Northern Berkshire Counties

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION;DEFINE CLASSES):

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

TREND:

PAST TO PRESENT: This is the first time this insect has been reported in nearly 10 years.

FUTURE:

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

COMMENTS:

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Saddled Prominent
(SPECIFIC NAME): Heterocampa guttaivitta

HOST: Sugar Maple, Beech and Birch

PRESENT CONDITION:

AREA (TOTAL ACRES): 1488 Acres

LOCATION: Berkshire County

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION;DEFINE CLASSES):
All 1488 acres were moderate to heavy defoliation

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

TREND:

PAST TO PRESENT: This is the second year the defoliation has been noted.

FUTURE:

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

COMMENTS: It is unknown what will happen to this population because there was a high degree of mortality caused by a species of Entomophaga.

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Pear Thrips

(SPECIFIC NAME): Taeniothrips inconsequens

HOST: Primary Host is Sugar Maple

PRESENT CONDITION:

AREA (TOTAL ACRES): No damage detected in aerial survey

LOCATION: Berkshire, Hampden, Hampshire, Franklin Counties

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION;DEFINE CLASSES):

The insect was present in large numbers throughout the infested area but caused little to no damage.

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

TREND:

PAST TO PRESENT: Caused severe defoliation in 1987 and 1988

FUTURE:

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

COMMENTS: Damage or noticeable defoliation may depend on the timing of insect emergence and bud development.

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Fall Cankerworm

(SPECIFIC NAME): Alsophila pametaria

HOST: Oak, Cherry, Maple, Birch, Linden, Apple

PRESENT CONDITION:

AREA (TOTAL ACRES): 800

LOCATION: Plymouth, Barnstable, and Nantucket Counties

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION;DEFINE CLASSES):

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

TREND:

PAST TO PRESENT: Defoliation reduced from 2,000 acres in 1989 to 800 acres in 1990

FUTURE: Infestation appears to be spreading from original infestation in the Town of Falmouth.

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

COMMENTS:

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Hemlock Wooly Adelgid
(SPECIFIC NAME):

HOST: Hemlock

PRESENT CONDITION:

AREA (TOTAL ACRES): 3 Acres

LOCATION: Hampden County (Springfield) and
Middlesex County (Waltham)

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION;DEFINE CLASSES):
Some trees in the area show a heavy infestation while other nearby hemlocks appear to be unfested.

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):
No mortality has been noted

TREND:

PAST TO PRESENT: There is on change in the infestation in Springfield and the Waltham infestation involves only 1 tree.
FUTURE:

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

COMMENTS: In both cases the infestation is in an ornamental situation.

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Brown Tail Moth
(SPECIFIC NAME): Eproctis chrysorrhoea

HOST: Beach Plum

PRESENT CONDITION:

AREA (TOTAL ACRES):

LOCATION: Cape Cod National Seashore

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION;DEFINE CLASSES):
Some mortality in the beach plum from repeated defoliation. The population seems to be stable

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

TREND:

PAST TO PRESENT: Since reported this pest has remained confined to the National Seashore

FUTURE:

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):
The Town of Truro and the Seashore have attempted control by clipping the winter nests.

COMMENTS:

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Oak leaf tier/roller complex
(SPECIFIC NAME): Croesia semipurpurana and Archips semiferanus
HOST: Red Oak

PRESENT CONDITION:

AREA (TOTAL ACRES): 80,000 Acres

LOCATION: Southern Worcester, Norfolk and Bristol Counties

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION;DEFINE CLASSES):
All defoliation is less than 30%

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

TREND:

PAST TO PRESENT: For the past 2 years this infestation has remained stable with defoliation limited to less that 30%
FUTURE:

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

COMMENTS: The infestation in the Warwick area (Franklin County) has fallen below the level of noticeable defoliation.

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Pine Needle Miner
(SPECIFIC NAME): Exoteleia pinefoliella

HOST: Pitch Pine

PRESENT CONDITION:

AREA (TOTAL ACRES): 1213 Acres

LOCATION: Plymouth and Barnstable Counties

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION;DEFINE CLASSES):
Heavy defoliation in Plymouth County

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

TREND:

PAST TO PRESENT: Insect has been present in the Plymouth area for several years

FUTURE:

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

COMMENTS:

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Nantucket Pine Tip Moth
(SPECIFIC NAME): Rhyacionia frustrana

HOST: 2 needle pines

PRESENT CONDITION:

AREA (TOTAL ACRES): 6613 Acres

LOCATION: Barnstable County, Towns of Truro, Wellfleet, and Eastham

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION;DEFINE CLASSES):

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

Small Pitch Pine have died in the Truro and Wellfleet area.

TREND:

PAST TO PRESENT: Infestation has been stable over the past several years.

FUTURE:

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

COMMENTS:

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Fall Webworm
(SPECIFIC NAME): Hyphantria cunea

HOST: Pin and Black Cherry

PRESENT CONDITION:

AREA (TOTAL ACRES): 400 Acres

LOCATION: Middlesex and Southern Worcester Counties

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION;DEFINE CLASSES):
A noted population increase was noted for this insect but heavy defoliation was observed in the above counties.

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

TREND:

PAST TO PRESENT: It appears that this is the start of a buildup of this pest.

FUTURE:

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

COMMENTS:

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Oak Dieback
(SPECIFIC NAME):

HOST:

PRESENT CONDITION:

AREA (TOTAL ACRES): 5465 Acres

LOCATION: Berkshire and Western Franklin and Hampshire Counties

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION;DEFINE CLASSES):

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

TREND:

PAST TO PRESENT: This was the first year this was problem was experienced.

FUTURE:

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

COMMENTS: After consulting with the University of Massachusetts, Shade Tree Lab and Plant Path. Department as well as the USDA Forest Service in both Durham NH and Hampden CT it was determined by Dr. Dave Houston that the problem was a weather related event.

MAINE

John R. McKernan, Jr.
Governor

C. Edwin Meadows
Commissioner

DEPARTMENT OF CONSERVATION

December 11, 1990

James P. Linnane
Field Representative
Forest Pest Management
Forestry Sciences Laboratory
PO Box 640
Durham, NH 03824

Dear Jim:

Attached is the insect portion of our forest pest conditions summary for Maine for 1990 as well as a summary of the situation regarding the European larch canker and Stillwell's Syndrome. The 1990 season was a busy one and along with our extensive commitment to the forest health monitoring effort, regular surveys and an upswing in populations of gypsy moth and hemlock looper commanded a very full work schedule. These efforts have provided some interesting as well as informative results. More detailed summaries of the seasons' activities will be available early in 1991 in an annual published summary.

Our two more notable pests in 1990 were the gypsy moth and hemlock looper, each of which generated their own sets of unique problems. While both insects generated public concern it was much easier to deal with the known aspects of population assessment in the case of the gypsy moth than the plethora of unknowns in the case of the hemlock looper complex. We do now have a slightly better understanding of hemlock looper, however, which is improving with experience.

In addition to the usual perennial problems there were a number of new and unusual ones in 1990 as well. These have not been included in this report because of their relatively minor status. Some of the new problems which we dealt with for the first time in 1990 were the euonymus caterpillar (Yponomeuta sp.), locust leafminer (Odontota dorsalis) and boxelder bug (Leptocoris trivittatus). Most of these pests were striking in their abundance and/or damage but were very localized. The conifer swift moth (Korscheltellus gracilus) appeared briefly in great numbers in a number of softwood stands especially in eastern Maine. In addition larvae of the confused Haploa (Haploa confusa) emerged in very large numbers early in the season in Crystal. The deer tick, Ixodes dammini, although not a tree pest, was monitored by one of our staff who found that it was increasing in abundance and in range distribution northward.

The attached summary sheets should provide the information which you need for most of our pests. Should you have need of more information, give me a call.

Sincerely,

David Struble
State Entomologist

Enclosures

MAINE

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Arborvitae Leaf Miner

(SPECIFIC NAME): Argyresthia thuiella; A. freyella; A. aureoargentella; and Recurvaria thujaella

HOST: Northern White Cedar -- Thuja occidentalis

PRESENT CONDITION: Populations dropped dramatically generally statewide except for slight increases in 7 locations

AREA (TOTAL ACRES): Unknown

LOCATION: Central, Eastern and Northern Maine

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES): Populations generally declined in 1990 survey.

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES): No data taken to estimate loss. Growth losses are apparent in many areas. Species is underutilized in the state.

TREND:

PAST TO PRESENT: Populations vary upward and downward in successive years Currently on a downward trend generally.

FUTURE: Situation will remain as in the past, Variable.

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS): None planned

COMMENTS: As the species increases in value, an increased emphasis must be placed on this pest due to the heavy growth loss and potential tree mortality.

1990 Arborvitae Leaf Miner Summary

Location	# of Live Larvae Per 3" Twig-1990	# of Live Larvae Per 3" Twig-1989	Increase Decrease
Palmyra	2.65	2.66	-0.01
Belgrade	2.09	3.46	-1.37
Plymouth	2.39	10.84	-8.45
Cornville	3.25	3.35	-0.10
Newport	2.87	3.81	-0.94
Freedom	1.72	6.01	-4.29
Detroit	3.66	6.80	-3.14
Whiting	1.67	3.24	-1.57
Trescott	1.71	2.26	-0.56
Edmunds	2.41	2.77	-0.36
Ludlow	1.04	0.22	+0.82
Moro	0.96	0.37	+0.59
Nashville	0.25	0.19	+0.06
Connor	0.47	0.41	+0.06
T9-R5	0.17	0.26	-0.09
Winterville	0.45	0.50	-0.05
Orient	1.53	1.13	+0.40
Macwahoc	1.57	3.29	-1.72
Little Squaw	0.32	0.18	+0.14
Seboomook	0.05	0.03	+0.02

1990 PEST CONDITIONS REPORT WORK SHEET

MAINE

CHRISTMAS TREE PESTS

PEST - (COMMON NAME): Balsam Twig Aphid, Balsam Gall Midge

(SPECIFIC NAME): Mindarus abietinus (Koch)
Paradiplosis tumifex (Gagne)

HOST: Balsam fir

PRESENT CONDITION:

AREA - TOTAL ACRES: 5,000 Acres

LOCATION: Statewide

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES):
Mindarus 1,000
Paradiplosis 3,000

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):
Control programs kept losses to a minimum

TREND:

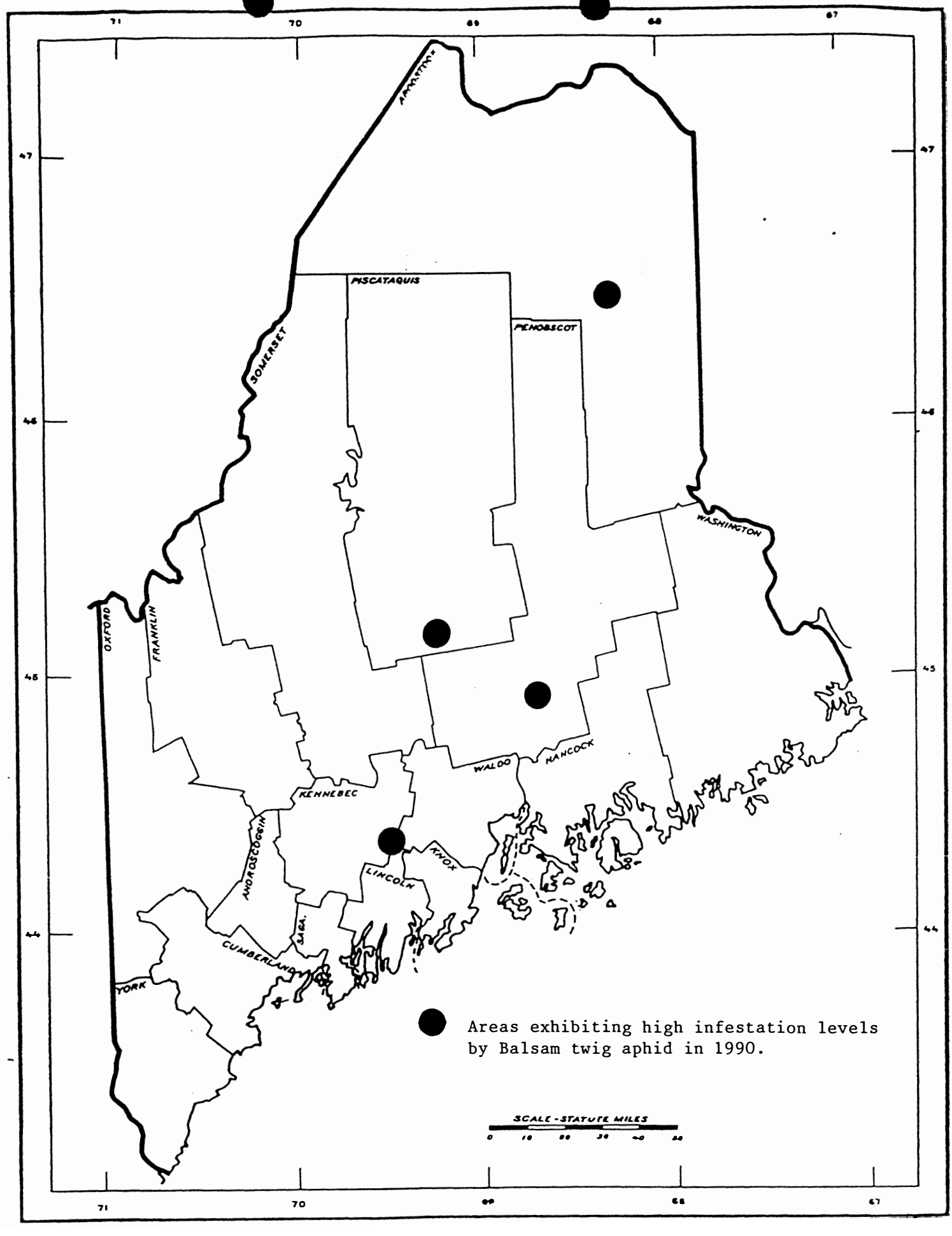
PAST TO PRESENT:

FUTURE:
Mindarus populations are expected to be stable.
Paradiplosis populations are expected to decrease.

CONTROL PROJECTS - METHOD, MATERIAL, ACRES, COST, RESULTS:
Both aerial and ground applications using diazinon were utilized on Christmas tree plantations scattered throughout the State.

COMMENTS:

MAINE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APROOSTOOK
PISCATAQUIS
PENOBSCOT
SOMERSET
WASHINGTON
OXFORD
FRANKLIN
KENNEBEC
WALDO
HANCOCK
ANDROSCOGGIN
KNOX
LINCOLN
SAGA.
CUMBERLAND
YORK
Areas exhibiting high infestation levels by Balsam twig aphid in 1990.
SCALE - STATUTE MILES
0
10
20
30
40
50

MAINE

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Balsam Woolly Adelgid

(SPECIFIC NAME): Adelges piceae (Ratz.)

HOST: Balsam Fir

PRESENT CONDITION:

AREA (TOTAL ACRES): Endemic throughout most of central and southern Maine

LOCATION: " " " " " "

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES): Trunk phase populations stable at 1989 levels over 200-500 acres primarily in North Central Penobscot County (Medway and T4 R9 NWP)

Gout phase which has been extremely common in the past in coastal areas seems to be moderating somewhat.

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES): Probably much higher than realized

TREND:

PAST TO PRESENT: Stabilized somewhat over previous seasons.

FUTURE: Not known

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS): None

COMMENTS:

MAINE

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Beech Bark Disease

(SPECIFIC NAME): Cryptococcus fagisuga/Nectria coccinea Complex

HOST: Beech

PRESENT CONDITION:

AREA (TOTAL ACRES): Throughout the resource

LOCATION: Statewide

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES): Various - most stands exhibit trees at all levels from uninfested to dead.

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES): Losses attributable to this pest complex are extensive but are complicated by the associated impact of drought (1988-89) and other insects. This makes an assessment difficult. This resource has also been underutilized in the pest and is only now receiving increasing attention.

TREND:

PAST TO PRESENT: We may be entering another wave of this problem. The frequency of sightings of beech heavily infested with scales continued to increase again in 1990 and trees exhibiting heavy fruiting of nectria was also more evident.

FUTURE: Unknown

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS): Dave Houston's work is the only effort in this direction at present.

COMMENTS:

MAINE

1990 PEST CONDITIONS REPORT WORKSHEET

PEST **(COMMON NAME):** Birch Casebearer

(SPECIFIC NAME): Coleophora serratella (L.)

HOST: White Birch

PRESENT CONDITION:

AREA (TOTAL ACRES): Spotty

LOCATION: Northern 2/3 of the State

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES): Scattered spots of noticeable defoliation were again reported from northern and central Maine and in the Rangeley area.

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES): No estimates available for 1990. Most aesthetic.

TREND:

PAST TO PRESENT: Stable and endemic

FUTURE: Not known

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS): None.

COMMENTS:

MAINE

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Birch Sawfly

(SPECIFIC NAME): Arge pectoralis (Loach)

HOST: Birch

PRESENT CONDITION:

AREA (TOTAL ACRES): Spotty

LOCATION: North Central Maine

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES): Light to moderate defoliation but very spotty; sometimes only a single tree.

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES): None

TREND:

PAST TO PRESENT: Down in both extent and severity in 1990.

FUTURE: Not known but expected to continue down overall.

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS): None

COMMENTS:

MAINE

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Browntail Moth

(SPECIFIC NAME): Euproctis chrysorrhoea

HOST: Willow, Cherry, Roses, Rubus, Oaks

PRESENT CONDITION: Appears to be increasing in intensity

AREA (TOTAL ACRES): 40+ acres known to be infested plus an unknown amount on the mainland.

LOCATION: Casco Bay islands, Long, Vail, and House and 8 towns on the mainland

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES): 2 - 3 acres of heavy to severe defoliation on Long Island. Vail generally infested, House generally overall, 8 towns and 24 locations found infested on the mainland in spring of 1990

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES): No tree mortality noted or expected.

TREND:

PAST TO PRESENT: Remained confined to three islands for several years. Found again on the mainland in 1989 in Freeport. In 1990, 7 other towns were found to have infestation.

FUTURE: Increase in number of islands becoming infested and further areas on the mainland becoming infested.

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS): No regular control undertaken. Visual survey of mainland areas undertaken and incidental webs found are clipped and destroyed. Pheromone trapping was undertaken in 1990 with poor results.

COMMENTS: Pheromone trapping in 1989 indicated areas to be scouted and webs were found in all of those areas. Trapping in 1990 did not result in the capture of any moths. Reason not yet explained.
State will continue to monitor and would assist in further study of use of pheromone traps as a survey tool.

MAINE

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Bruce Spanworm, Fall Cankerworm and Spring Cankerworm

(SPECIFIC NAME): Operophtera bruceata (Hulst)
Alsophila pometaria (Harris)
Paleacrita vernata (Peck)

HOST: Various hardwoods

PRESENT CONDITION:

AREA (TOTAL ACRES): 0

LOCATION:

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES): No defoliation reported in 1990

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES): None

TREND:

PAST TO PRESENT: Stable at low endemic levels

FUTURE: Not known

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS): None

COMMENTS:

1990 PEST CONDITIONS REPORT WORK SHEET

MAINE

PEST - (COMMON NAME): Eastern Larch beetle

(SPECIFIC NAME): Dendroctonus simplex

HOST: Eastern Larch

PRESENT CONDITION:

AREA - TOTAL ACRES: undetermined

LOCATION: Statewide

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES):
Not measured in 1990 but apparently at same level as 1989.

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):
Heavy volume lost, but undetermined.

TREND:

PAST TO PRESENT:
Annual mortality in range of 5% per year.

FUTURE:

CONTROL PROJECTS - METHOD, MATERIAL, ACRES, COST, RESULTS:
Salvage is recommended in infested stands.

COMMENTS:
Damage in a commercial seed orchard was high systemic implants were tried to limit damage.

MAINE

1990 PEST CONDITIONS REPORT WORKSHEET

PEST **(COMMON NAME):** European Larch Canker

(SPECIFIC NAME): Lachnellula willkommii

HOST: Eastern & European Larch

PRESENT CONDITION: 4 new towns added to quarantine in 1989. No further additions in in 1990. Area remains relatively unchanged.

AREA (TOTAL ACRES): 6,500 (approximate)

LOCATION: Knox, Lincoln, Waldo, and Washington counties, partially.

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES): At the two epicenters, Cutler-Jonesboro and Friendship, infection is heavy; light to moderate elsewhere.

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES): No matuer tree loss has been observed, only sapling & pole size trees. Volume estimates not available.

TREND: Since 1985 the area has remained constant except for the four towns added in 1989. No major increase in size forseen. area is expected to remain as is.

PAST TO PRESENT:

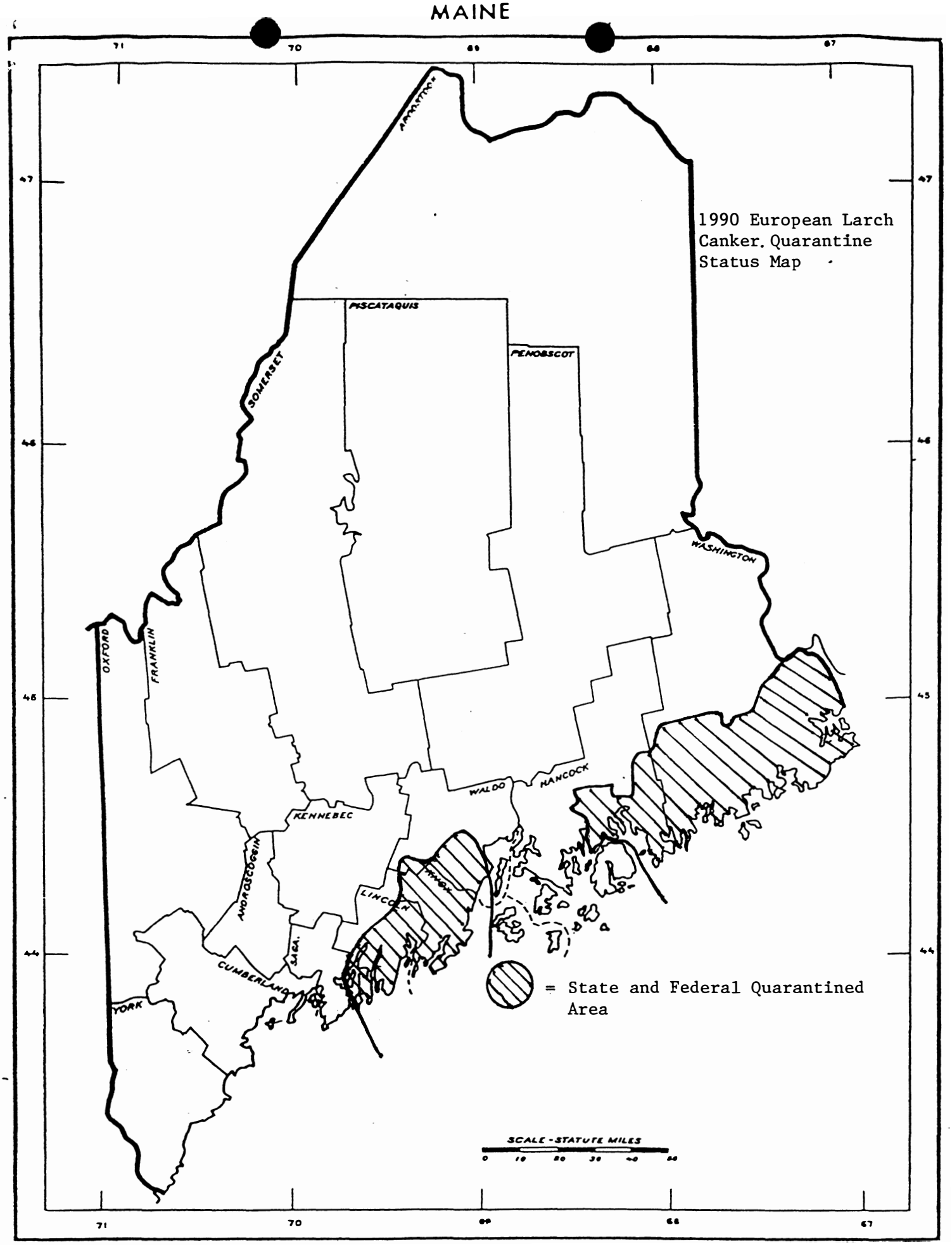
See above

FUTURE: No major increase expected..

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS): State and Federal quarantine regulations in effect and are being enforced. Due to other priorities no survey was done in 1990.

COMMENTS: Larch utilizers are under compliance agreements to receive wood from the quarantined area.

MAINE


1990 European Larch Canker. Quarantine Status Map
PISCATAQUIS
PENOBSCOT
SOMERSET
WASHINGTON
OXFORD
FRANKLIN
KENNEBEC
WALDO
HANCOCK
ANDROSCOGGIN
LINCOLN
CUMBERLAND
YORK
= State and Federal Quarantined Area
SCALE - STATUTE MILES
0 10 20 30 40 50
71
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MAINE
1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Fall Webworm

(SPECIFIC NAME): Hyphantria cunea (Drury)

HOST: Many deciduous hosts

PRESENT CONDITION:

AREA (TOTAL ACRES): Locally very heavy populations

LOCATION: Statewide but heaviest in central and southwestern Maine

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES): Still primarily an aesthetic problem although feeding and webbing were heavy in 1990 for the third consecutive year.

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES): Aesthetic damage and possibly some partial branch and twig mortality.

TREND:

PAST TO PRESENT: Stable at high 1989 levels and some minor extension of low populations to the north and east.

FUTURE: Not known but expected to be high again locally in 1991

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS): None

COMMENTS:

MAINE
1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Forest Tent Caterpillar

(SPECIFIC NAME): Malacosoma disstria Hbn.

HOST: Primarily poplar but also other hardwoods

PRESENT CONDITION:

AREA (TOTAL ACRES): 0

LOCATION: 0

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES): Very low numbers (usually individuals) statewide

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES): None

TREND:

PAST TO PRESENT: Continued very low populations

FUTURE: Not known (see comments)

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS): None

COMMENTS: Although no significant populations are expected in 1991, we are watching the situation to our west in Quebec where heavy defoliation was reported in western parts of the Province in 1990. If conditions proceed as they have in the past with regard to outbreaks, we could possibly see an increasing problem as early as 1992.

1990 PEST CONDITIONS REPORT WORK SHEET

MAINE

PEST - (COMMON NAME): Gypsy Moth

(SPECIFIC NAME): Lymantria dispar

HOST: Primarily Red oak with a variety of both hardwood and softwood species.

PRESENT CONDITION:

AREA - TOTAL ACRES: 270,537 Acres

LOCATION: Southern and eastern Maine

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES):

Light less than 30% defoliation	46,512
Moderate 31 - 60% defoliation	82,475
Heavy 61 - 100% defoliation	141,550

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):
Tree mortality is light (less than 10%) but loss of regeneration and degrade of hardwood is significant.

TREND:

PAST TO PRESENT:
Increased 34,000 Acres 1989 - 270,000 Acres 1990

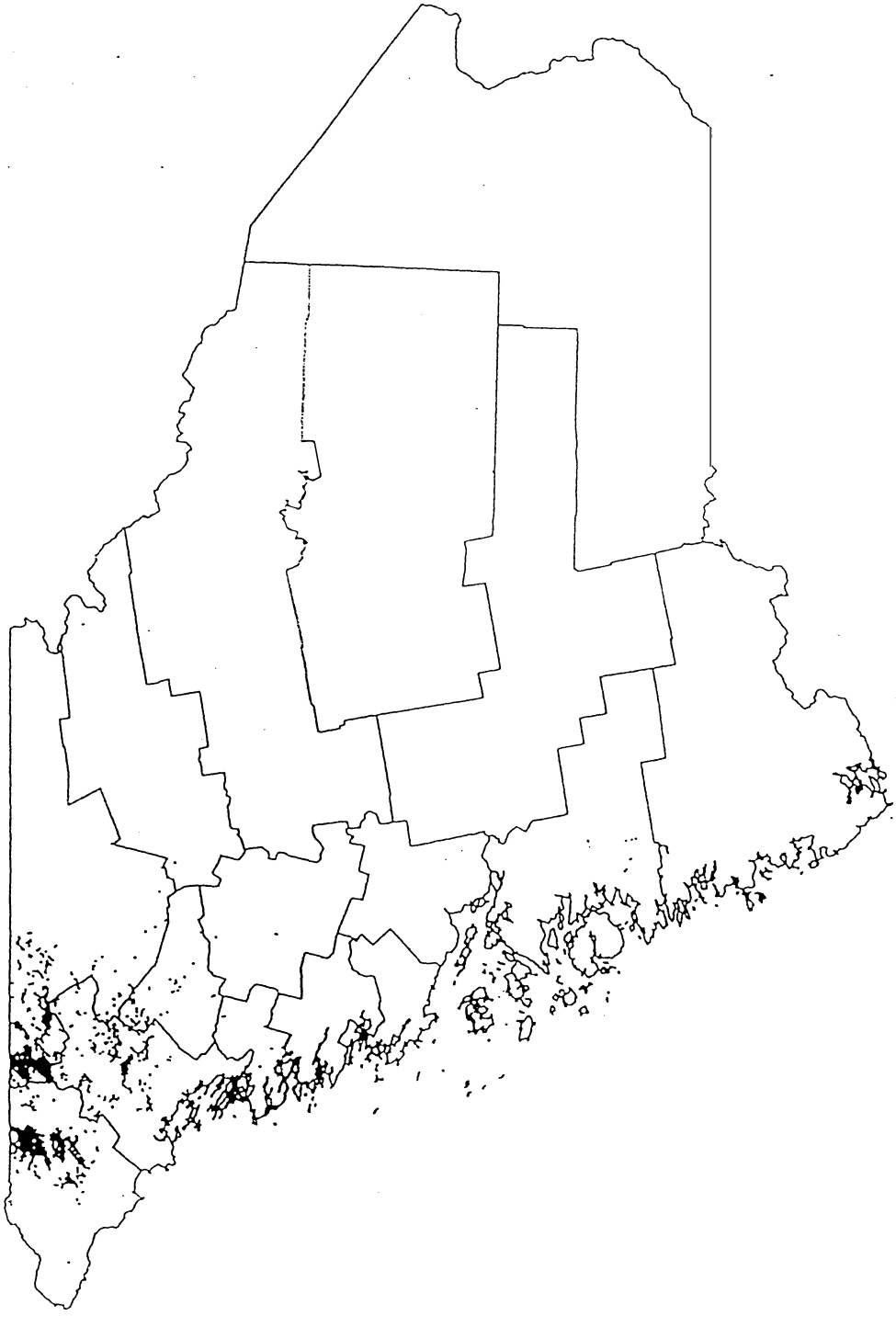
FUTURE:
Populations are expected to shift to nearby locations and maintain high acreage in 1991.

CONTROL PROJECTS - METHOD, MATERIAL, ACRES, COST, RESULTS:
Approximately 3,000 acres treated ground and aerially with B.t. in private projects.

1991 Cooperative funding has been applied for however, acreage has not yet been determined.

COMMENTS: The gypsy moth has been found in four previously uninfested towns north of the quarantine boundary. These towns are: Island Falls, West Forks Plt., Rangeley and Lower Cupsuptic Twp. These and adjoining towns have been submitted to the USDA, APHIS, PPQ for inclusion in the gypsy moth quarantine.

1990
GYPSY MOTH DEFOLIATION
IN MAINE



MAINE

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NANE): Hemlock Looper
(SPECIFIC NAME): Lambdina fiscellaria fiscellaria

HOST: Hemlock, Balsam fir, White Spruce

PRESENT CONDITION: The hemlock looper infestation in Maine expanded and intensified in 1990 and currently has caused heavy defoliation to 20,000 acres of hemlock in southeastern Maine.

AREA (TOTAL ACRES): 20,000 acres of heavy damage to hemlock, 80,000 acres of moderate damage to hemlock and fir

LOCATION: Looper has been found nearly state wide but the heaviest damage is located in central Penobscot, southern Aroostock, northern Hancock, western Washington, and Waldo counties.

SEVERITY (INCLUDE AREAS OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES): 20,000 acres heavy defoliation (30 to 80% total defoliation on hemlock) (See map). 80,000 acres of light to moderate defoliation (10 to 30% total defoliation - ground survey)

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES): 300 acres of 50% or more hemlock mortality, 5,000 acres of 10% or more hemlock mortality, 100 acres of scattered fir and spruce mortality on islands near Mt. Desert Island

TREND: Increasing

PAST TO PRESENT: The increasing hemlock looper population in Maine was first discovered in 1988 and has shown a steady increase through the fall of 1990. The infestation has increased in area and intensity.

FUTURE: Preliminary egg samples processed in the fall of 1990 show high predicted looper population over a greatly expanded area. Also, some 1990 counts are several times higher than those seen during the winter of 1989-90.

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS): Possible control of looper damage using Bt. is being investigated.

COMMENTS: A survey method for predicting hemlock looper populations and damage on hemlock was researched in Maine by the Maine Forest Service during 1990. A preliminary egg to defoliation relationships was developed and this relationship will be studied further in 1991. The MFS also plans to establish impact plots to assess long term damage effects to hemlock due to looper.

MAINE

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): A Hemlock Looper

(SPECIFIC NAME): Lambdina athasaria (Walk.)

HOST: Hemlock

PRESENT CONDITION:

AREA (TOTAL ACRES): 1,800 acres of heavy to severe defoliation

LOCATION: Several towns affected mostly north and west of Sebago Lake (western and northern Cumberland County and southern Oxford County (see Hemlock Looper Map)

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES): 1,000 acres of severe defoliation (80-100%) with 25% or more mortality to hemlock. 800 acres of moderate to heavy defoliation (30-80%) with scattered mortality to intermediate and suppressed trees.

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES): Mortality very evident (up to 25% or more) over 1,000 acres North and West of Sebago Lake. Spotty elsewhere. Dead trees have accelerated harvest plans in these areas.

TREND:

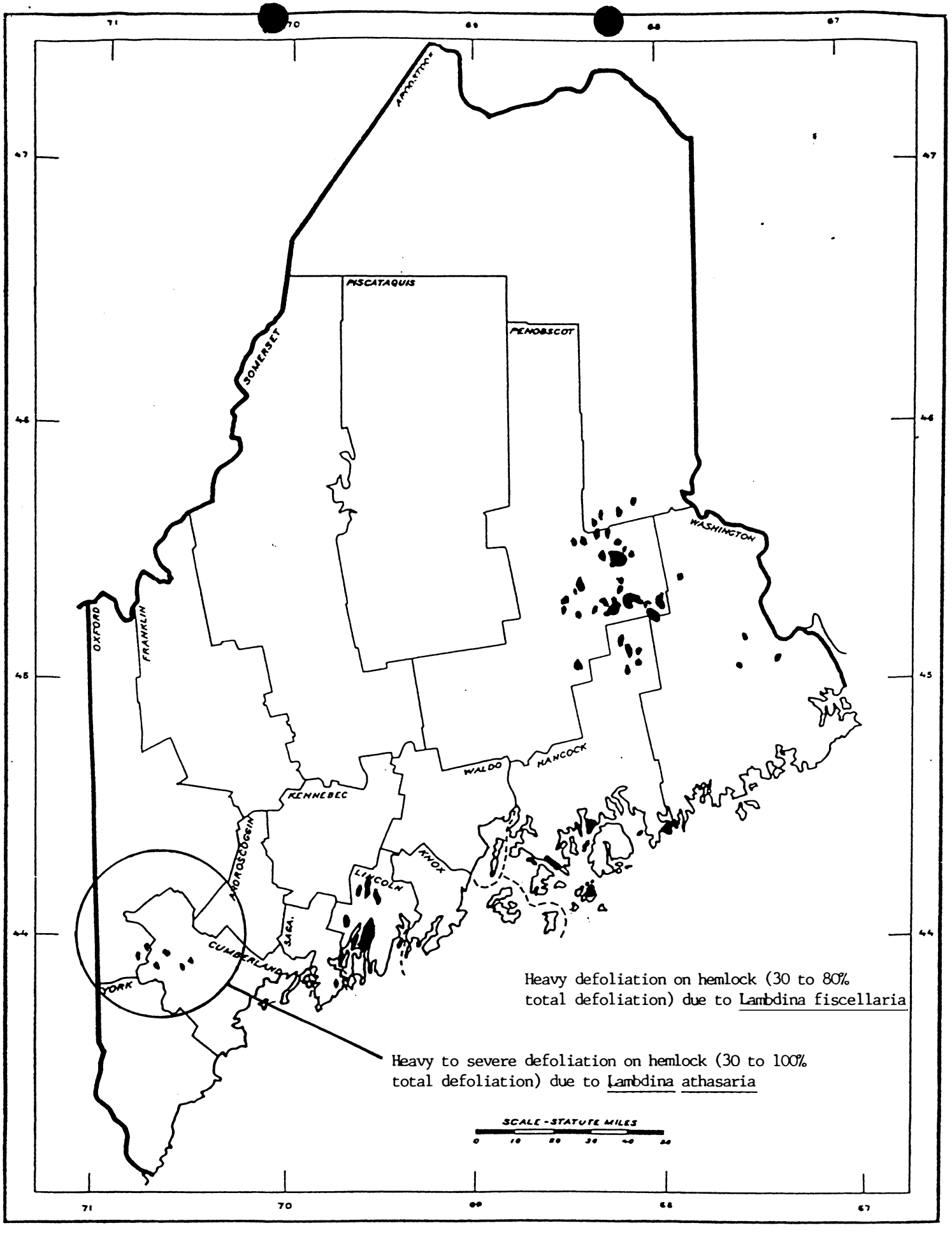
PAST TO PRESENT: Very heavy defoliation in 1989 and 1990

FUTURE: Not known but at least moderate populations are expected in or near areas previously defoliated.

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS): Salvage cuts of defoliated hemlock have been conducted in the more heavily damaged areas. Possibly as much as 1,000 acres was harvested North and West of Sebago Lake in 1990.

COMMENTS: The habits of this species are not fully understood making it difficult to separate this species from L. fiscellaria. Lambdina athasaria appears to be primarily southern but mixes with L. fiscellaria throughout. Populations of L. athasaria fade out north and east of Sebago Lake. This species seems to favor hemlock over other softwoods more than L. fiscellaria.

MAINE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AROOSTOOK
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PENOBSCOT
SOMERSET
WASHINGTON
OXFORD
FRANKLIN
WALDO
HANCOCK
KENNEBEC
ANDROSCOGGIN
KNOX
LINCOLN
SAGA.
CUMBERLAND
YORK
Heavy defoliation on hemlock (30 to 80% total defoliation) due to Lambdina fiscellaria
Heavy to severe defoliation on hemlock (30 to 100% total defoliation) due to Lambdina athasaria
SCALE - STATUTE MILES
0 10 20 30 40 50

MAINE

1990 PEST CONDITIONS REPORT WORKSHEET

PEST **(COMMON NAME):** Large Aspen Tortrix

(SPECIFIC NAME): Choristoneura conflictana (Walker)

HOST:

PRESENT CONDITION:

AREA (TOTAL ACRES): 12,000 acres ±

LOCATION: Near Jackman (Somerset County)

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES): Moderate to severe defoliation

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES): None

TREND:

PAST TO PRESENT: Up strikingly across central Maine but especially in western portions near Jackman.

FUTURE: Not known although at least some defoliation is expected again in 1991.

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS): None.

COMMENTS: Extremely heavy moth flights caused some concern in the Jackman area in early July. Moths were very abundant around outdoor lighting.

MAINE

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Late Season Hardwood Defoliator Complex

(SPECIFIC NAME): Numerous species

HOST: Northern Hardwoods

PRESENT CONDITION:

AREA (TOTAL ACRES): Statewide

LOCATION: "

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES): Down strikingly in 1990 (see comments)

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES): None reported

TREND:

PAST TO PRESENT: Down sharply

FUTURE: Not known

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS): None

COMMENTS: This complex of more than 25 species which made its surprising appearance first in 1987 and peaked in 1988 with 120,000 acres in damage dropped sharply in intensity in 1990. Most of the 1990 damage was attributable to the variable oak leaf caterpillar (see discussion under that species). The birch sawfly (Arge pectoralis) and pale tussock (Halysidota tessellaris) were also abundant but damage was minimal by these species. The orange-humped mapleworm (Symmerista leucitys) all but disappeared.

MAINE

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Maple Leafroller

(SPECIFIC NAME): Sparganothus acerwoiana (Mackay)

HOST: Red Maple

PRESENT CONDITION:

AREA (TOTAL ACRES): 20,000 - 30,000 acres

LOCATION: South Central Hancock County (see map)

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES): Light to moderate defoliation

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES): Some stress related mortality observed on individual older trees.

TREND:

PAST TO PRESENT: Down in severity in 1990 from 1989 levels but some expansion of the infested area.

FUTURE: Populations expected to continue downward

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS): None .

COMMENTS:

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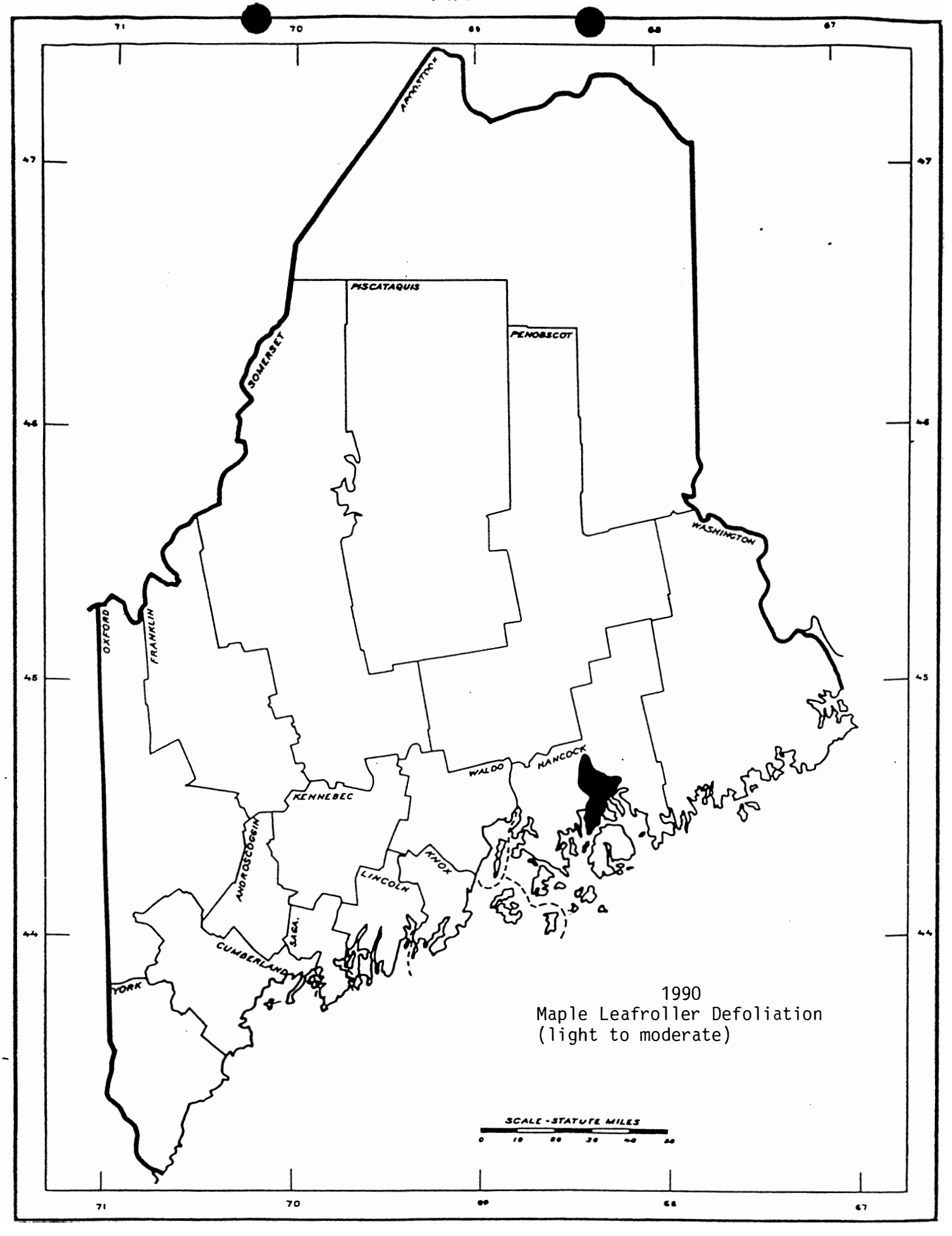
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APROOSTOOK
PISCATAQUIS
PENOBSCOT
SOMERSET
WASHINGTON
OXFORD
FRANKLIN
WALDO
HANCOCK
KENNEBEC
ANDROSCOGGIN
KNOX
LINCOLN
SAGA.
CUMBERLAND
YORK
1990
Maple Leafroller Defoliation
(light to moderate)
SCALE - STATUTE MILES
0
10
20
30
40
50

1990 PEST CONDITIONS REPORT WORK SHEET

MAINE

PEST - (COMMON NAME): Pales weevil

(SPECIFIC NAME): Hylobius pales

HOST: Pines, spruces and balsam fir

PRESENT CONDITION:

AREA - TOTAL ACRES: unknown

LOCATION: Statewide

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES):
Localized - known to be severe on 10 Acres.

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):
Required control in Dover area - severe damage to balsam fir planting.

TREND:

PAST TO PRESENT:
Highly variable due to specific site requirements.

FUTURE:

CONTROL PROJECTS - METHOD, MATERIAL, ACRES, COST, RESULTS:
10 Acres controlled using Lindane with permit from Board of pesticides Control, Maine Department of Agriculture.

COMMENTS:

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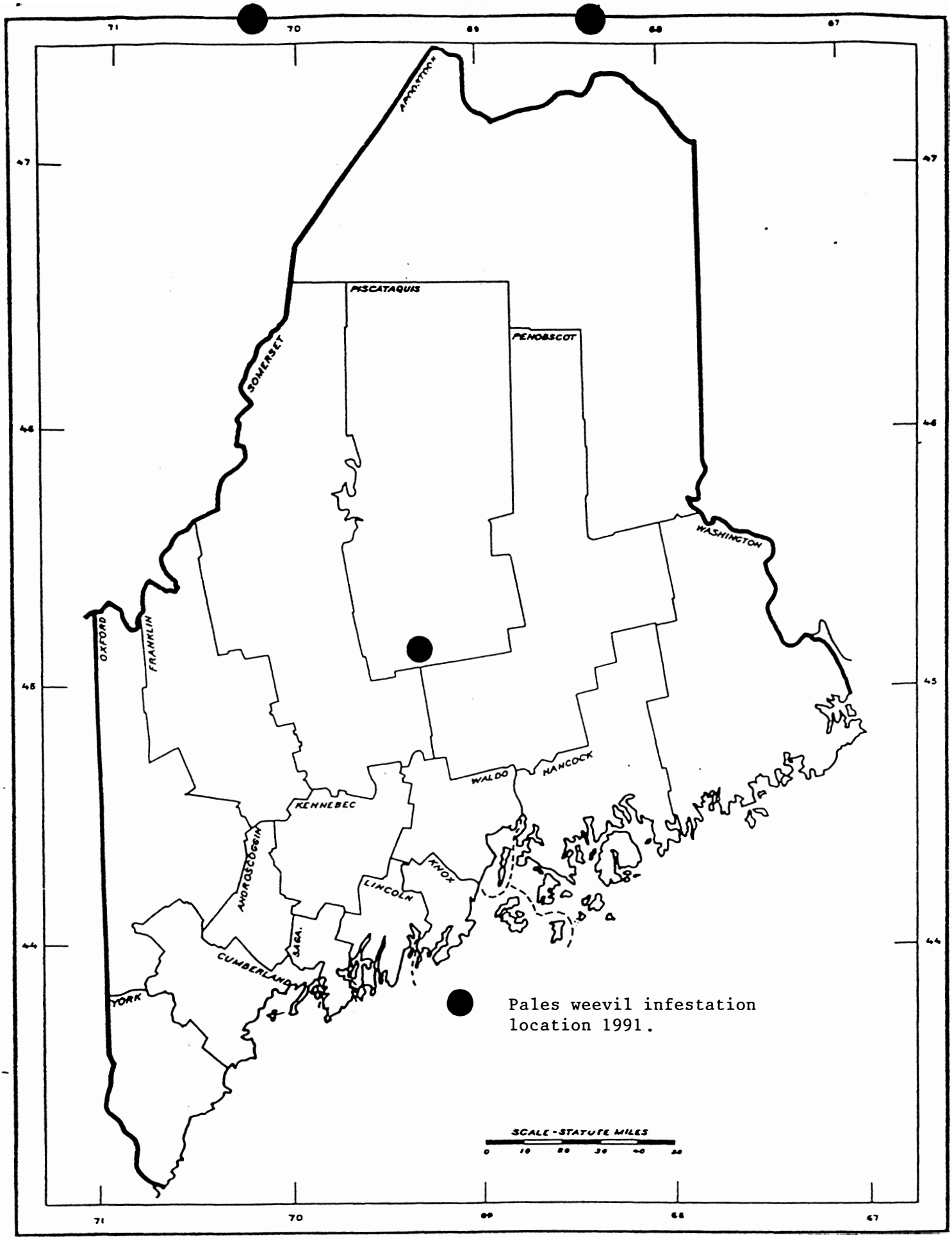


Pales weevil infestation location 1991.

MAINE

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Pear Thrips

(SPECIFIC NAME): Taeniothrips inconsequens (Uzel)

HOST: Sugar Maple

PRESENT CONDITION:

AREA (TOTAL ACRES): 0

LOCATION: Statewide

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES): None to trace

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES): None

TREND:

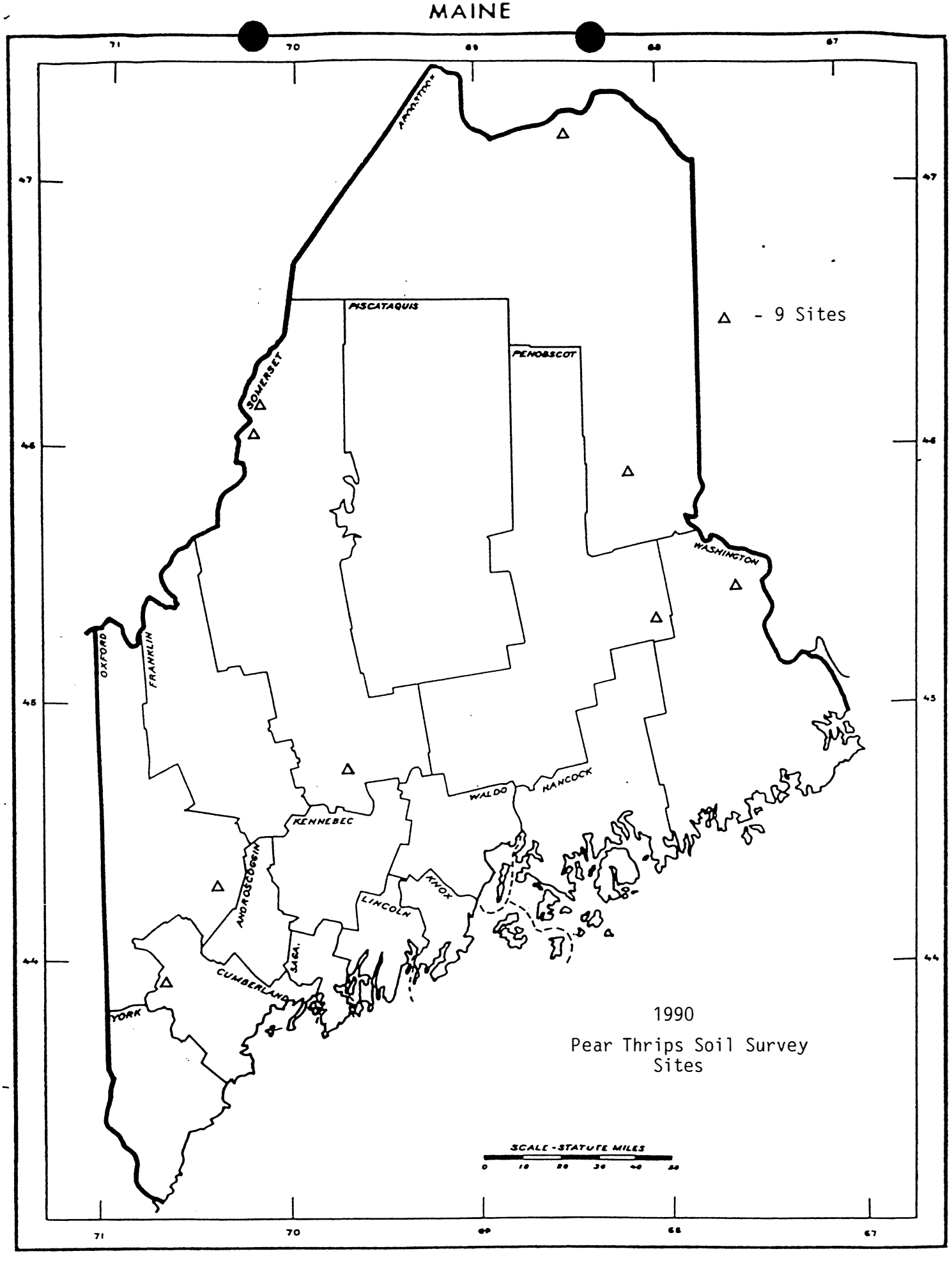
PAST TO PRESENT: Stable at very low endemic levels

FUTURE: Not known

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS): None

COMMENTS: Individual trees with moderate numbers of thrips but very light injury were observed in southwestern Maine.

Nine (9) sites (see map) were sampled this fall for overwintering thrips. Samples are being evaluated at the Univ. of Vermont. These sites were numbered for future monitoring.


MAINE
△ - 9 Sites
AROOSTOOK
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PENOBSCOT
SOMERSET
WASHINGTON
OXFORD
FRANKLIN
WALDO
HANCOCK
KENNEBEC
ANDROSCOGGIN
KNOX
LINCOLN
SAG.
CUMBERLAND
YORK
1990
Pear Thrips Soil Survey
Sites
SCALE - STATUTE MILES
0 10 20 30 40 50

MAINE

1990 PEST CONDITIONS REPORT WORKSHEET

PEST **(COMMON NAME):** Pinewood Nematode

(SPECIFIC NAME): Bursaphelenchus xylophilus

HOST: Confirmed in Maine from White Pine, Red Pine and Balsam Fir

PRESENT CONDITION: Total extent unknown at this time. 15 locations found infected.

AREA (TOTAL ACRES): Unknown at this time

LOCATION: Found in 9 counties of the state.

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES): Unknown

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES): No attributal losses to pinewood nematode

TREND:

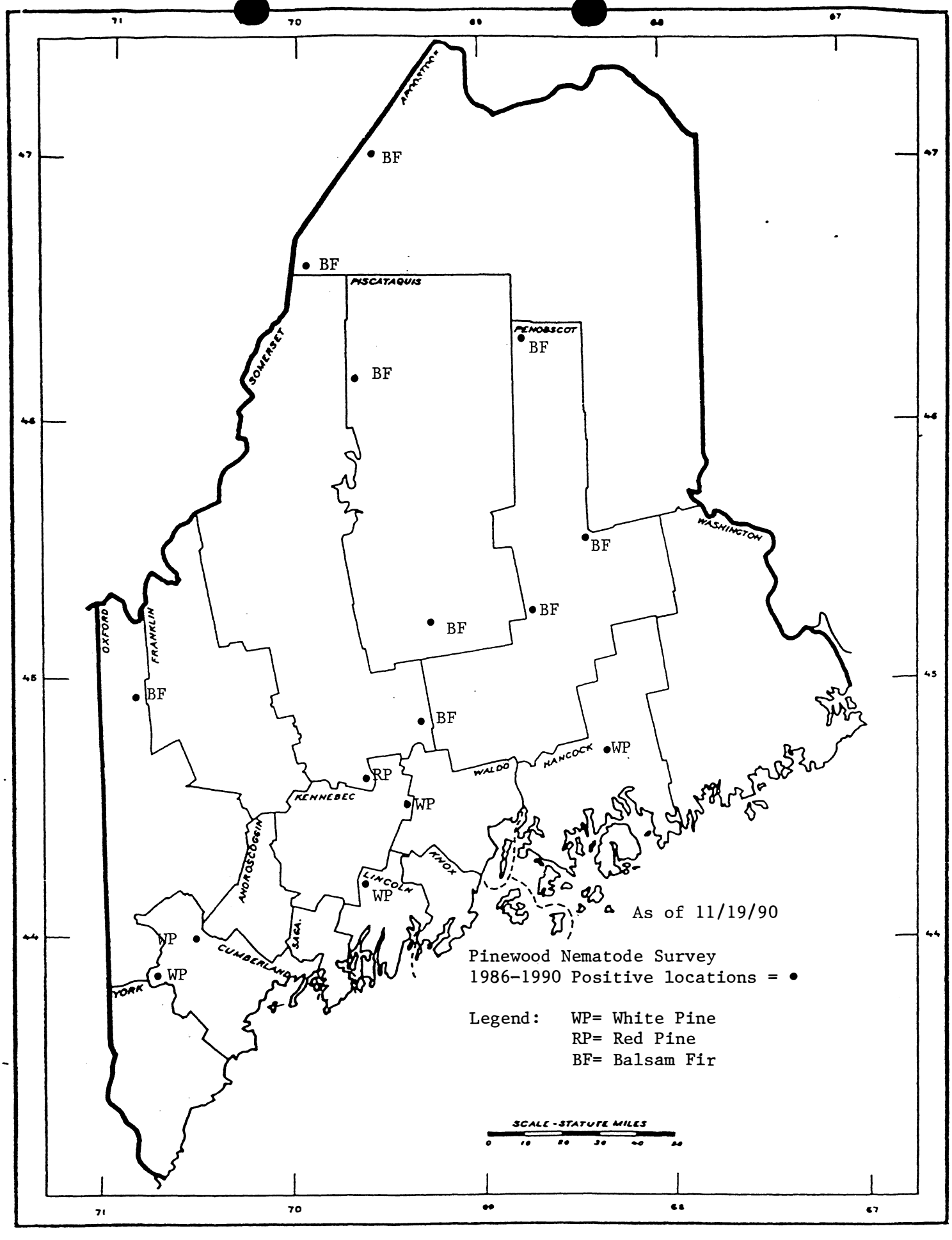
PAST TO PRESENT: Since 1986 a survey has been done but due to other priorities no survey was done in 1990.

FUTURE: Further sampling will likely find other areas infected, but potential hazard is considered minimal at this time.

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS): None

COMMENTS: Survey procedures expected to be reinstituted in 1991

MAINE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HANCOCK
ANDROSCOGGIN
KNOX
LINCOLN
SAG.
CUMBERLAND
YORK
BF
RP
WP
As of 11/19/90
Pinewood Nematode Survey
1986-1990 Positive locations = •
Legend: WP= White Pine
RP= Red Pine
BF= Balsam Fir
SCALE - STATUTE MILES
0 10 20 30 40 50

MAINE

1990 PEST CONDITIONS REPORT WORKSHEET

PEST **(COMMON NAME):** Satin Moth

(SPECIFIC NAME): Leucoma salicis (L.)

HOST: Aspen especially big tooth aspen

PRESENT CONDITION:

AREA (TOTAL ACRES): Less than 50 acres total, mapped

LOCATION: Hancock (Hancock County), Addison and Jonesboro (Washington County) (see map).

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES): Heavy defoliation of small isolated stands or clumps of trees. The largest area was probably less than 30 acres in size in Jonesboro.

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES): None

TREND:

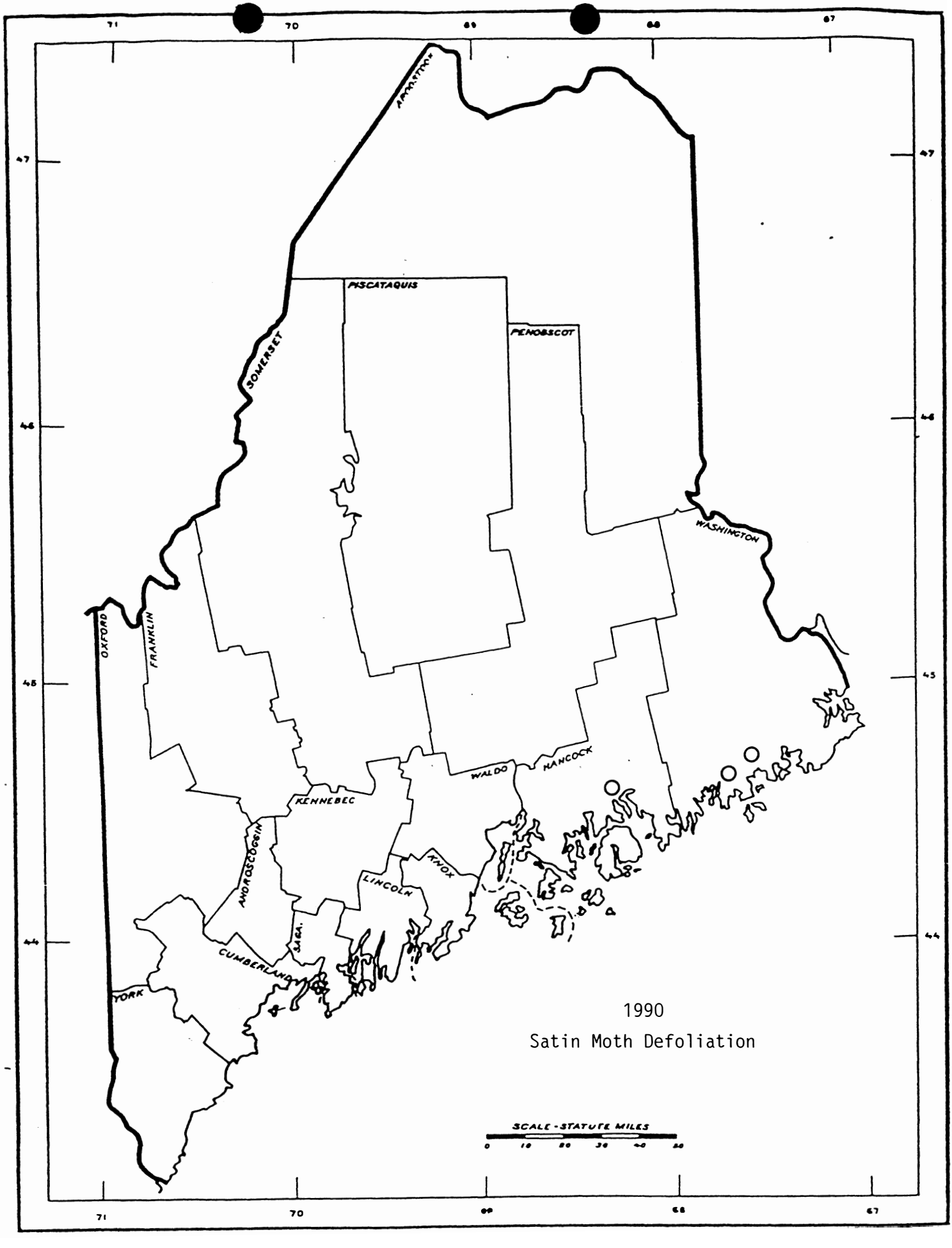
PAST TO PRESENT: Up in 1990

FUTURE: Not known

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS): None

COMMENTS: Parasites fairly abundant in areas checked.

MAINE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KENNEBEC
WALDO
HANCOCK
ANDROSCOGGIN
KNOX
LINCOLN
SAGA.
CUMBERLAND
YORK
1990
Satin Moth Defoliation
SCALE - STATUTE MILES
0 10 20 30 40 50

MAINE

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NANE): Spruce Beetle
(SPECIFIC NAME): Dendroctonus rufipennis

HOST: White Spruce, Red Spruce, occasionally Black Spruce

PRESENT CONDITION: Spruce beetle is now found throughout the northern half of Maine wherever stands of old growth, white and red spruce persist.

AREA (TOTAL ACRES): 9,000 acres of confirmed spruce beetle activity have been located

LOCATION: Infested trees are found throughout the northern half of Maine. The most extensive areas found are near the Allagash River and near Portage in the northeast

SEVERITY (INCLUDE AREAS OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES): 9,000 acres of heavy infestation (more than 25% of the spruce stems), scattered individual trees and small groups of trees are also infested.

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES): In the areas of heavy infestation 50% or more of the large (> 15" DBH) white spruce have been killed. Areas in western Maine have suffered a 50% or greater loss of red spruce over 12" DBH. Most large infested areas have been or are being salvaged.

TREND: Stable

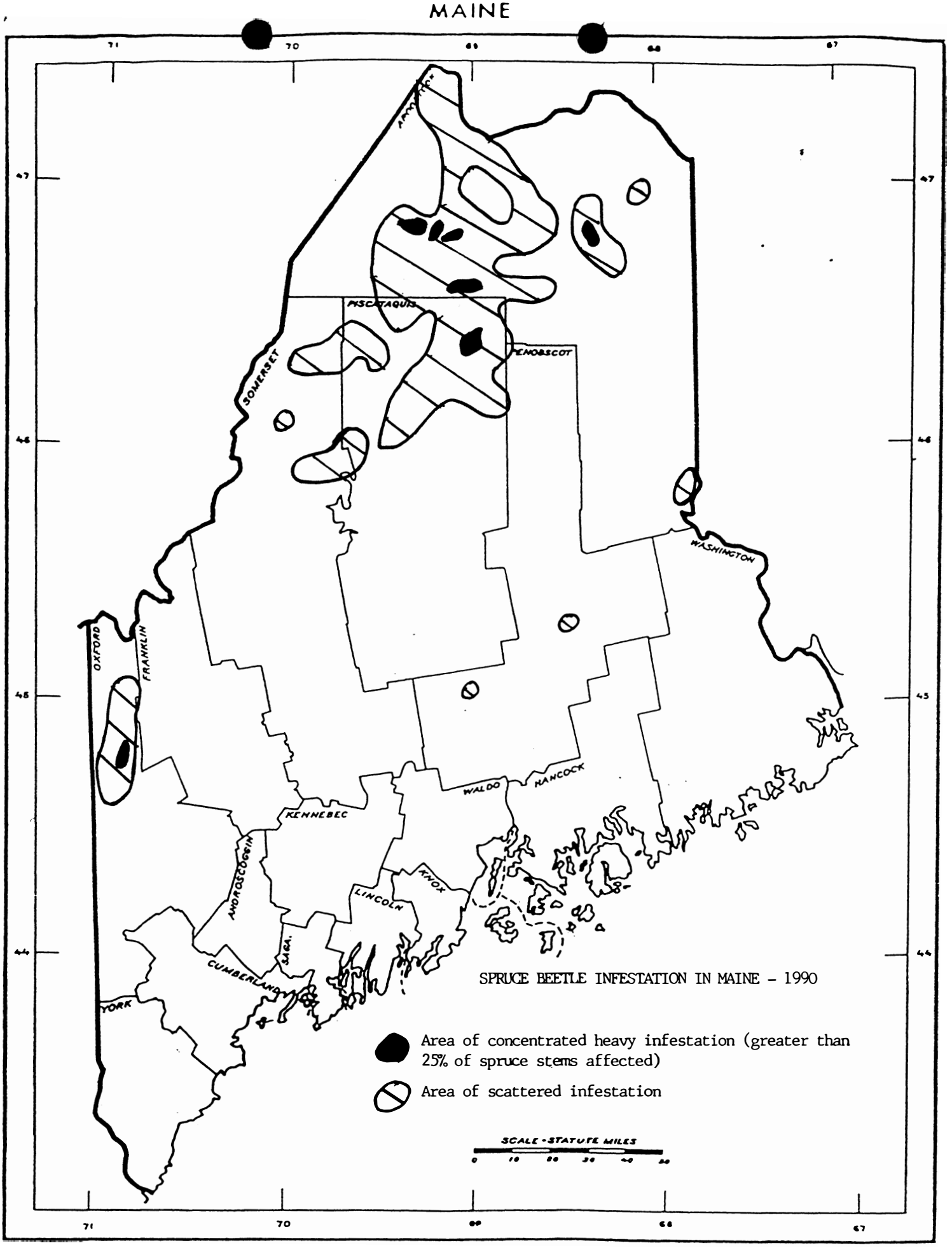
PAST TO PRESENT: The current infestation began in 1985 and has increased in size and intensity since. This increase has not been steady but rather has experienced several surges in activity.

FUTURE: The future trend of the beetle infestation is unknown but damage in some stands seems to have peaked. New areas, however, are located annually.

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS): Salvage cutting. Some stands are remote or are in preservers and will not be salvaged.

COMMENTS: The Maine Forest Service has surveyed the spruce beetle infestation extensively and has reported its findings to affected landowners. Many landowner representatives have been trained by the MFS in the identification and management of spruce beetle. Many landowners are now able to use color infared photography to precisely locate beetle damage. Active cooperation between landowners and the MFS has resulted in effective salvage and utilization of most beetle killed timber.

MAINE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FRANKLIN
WALDO
HANCOCK
KENNEBEC
ANDROSCOGGIN
KNOX
LINCOLN
SAGA.
CUMBERLAND
YORK
SPRUCE BEETLE INFESTATION IN MAINE - 1990
Area of concentrated heavy infestation (greater than 25% of spruce stems affected)
Area of scattered infestation
SCALE - STATUTE MILES
0
10
20
30
40
50

MAINE

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NANE): Spruce Budworm

(SPECIFIC NAME): Choristoneura fumiferana (Clem.)

HOST: Balsam fir, Red spruce, White spruce, Black spruce, Hemlock

PRESENT CONDITION: The spruce budworm infestation in Maine has collapsed and populations are at or near endemic levels

AREA (TOTAL ACRES): No budworm defoliation was detected in Maine in 1990

LOCATION: Trace feeding and larvae were found in Waltham in Hancock County and in Steuben and Jonesboro in Washington County

SEVERITY (INCLUDE AREAS OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES): Very small patches of trace (0-5%) damage were found on the southeast coast.

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES): New host mortality appears secondary in nature due to other agents.

TREND: Declining

PAST TO PRESENT: The trend since 1985 has been a sharp decline. The last remaining outbreak area in the southeast has now also collapsed.

FUTURE: This pest is expected to remain at endemic levels for some time.

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS): None

COMMENTS: A network of 20 budworm pheromone tray locations were established throughout the state's spruce fir type. These 60 traps caught a total of 4 budworm moths. Also, Maine's statewide network of light traps caught very few budworm. A total of 107 moths were caught in light traps and 3/4 of these came from those traps in Steuben in Washington County. Budworm population status is not likely to change in 1990.

MAINE

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NANE): Stillwell's Syndrome (Red Fir)

(SPECIFIC NAME):

HOST: Balsam Fir

PRESENT CONDITION: Stillwell's syndrome or "red fir" stabilized at relatively low 1989 levels in most of Maine in 1990. However, an area in southern and central Hancock County showed a sharp increase in the number of trees affected in 1990.

AREA (TOTAL ACRES): 500,000 acres of increased occurrences , very low levels on 6.5 million acres

LOCATION: Increase occurrence was noted in central and southern Hancock County in an area from Waltham south to the coast.

SEVERITY (INCLUDE AREAS OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES): Scattered individual dead trees, less than 1% of fir affected in most of Maine, up to 5% of fir affected in portion of southern Hancock County.

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES): Losses continue to be in the form of individual stems in and near areas heavily damaged by past spruce budworm feeding. After the needles drop from affected trees mortality from Stillwell's can not be differentiated from budworm mortality.

TREND: Stable in most of the State

PAST TO PRESENT: In northern and central Maine the incidence of Stillwell's has gradually decreased since the mid 80's. The problem is now more common in the southeast where spruce budworm persisted into the late 80's.

FUTURE: Stillwell's will probably continue to kill a significant number of fir stems in the southeast for 3 to 5 years but, its significance is much reduced in northern and central Maine.

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS): None

COMMENTS: As in the past all Stillwell's trees examined were found to have Armillaria mellea infection. The portion of Hancock County which showed increased Stillwell's activity in 1990 was the last residual budworm infestation in Maine. This area has now collapsed and the incidence of Stillwell's syndrome is likely to follow within 3 to 5 years.

1990 PEST CONDITIONS REPORT WORK SHEET

MAINE

PEST - (COMMON NAME): Sugar Maple Decline

(SPECIFIC NAME):

HOST: Sugar Maple

PRESENT CONDITION:

AREA - TOTAL ACRES: 2,625,800 Acres

LOCATION: Western portion of the State.

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES):
Less than 10% crown dieback in 18 plots maintained to monitor health.

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):
Insignificant

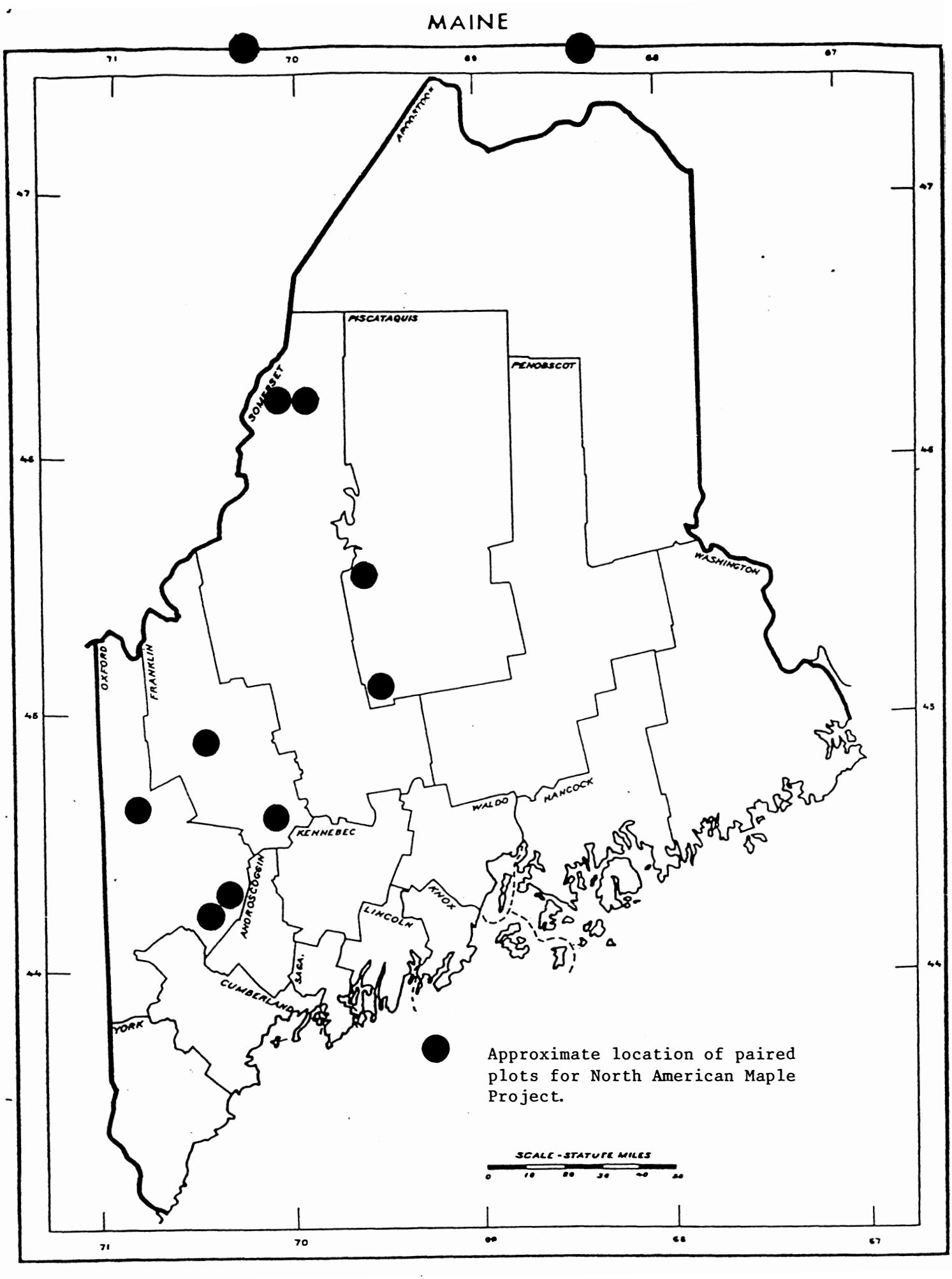
TREND:

PAST TO PRESENT: Static

FUTURE:

CONTROL PROJECTS - METHOD, MATERIAL, ACRES, COST, RESULTS:
None required

COMMENTS:
North American Maple Project plots maintain to monitor long term condition within sugar maple stands.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SAG.
CUMBERLAND
YORK
Approximate location of paired plots for North American Maple Project.
SCALE - STATUTE MILES
0
10
20
30
40
50

MAINE

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Variable Oakleaf Caterpillar

(SPECIFIC NAME): Lochmaeus manteo Doubleday

HOST: Primarily Beech

PRESENT CONDITION:

AREA (TOTAL ACRES): 14,000 acres of moderate to heavy damage. Possibly 100,000 acres of spotty light defoliation.

LOCATION: Eastern Maine primarily but also some in west central Maine (see map)

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES): 14,000 acres of moderate to heavy damage affecting all age classes. Possibly up to 100,000 acres of defoliation of varying intensity but which appeared heaviest on scattered and understory beech which was difficult to detect from the air.

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES): Not known. Certainly another stress factor for beech.

TREND:

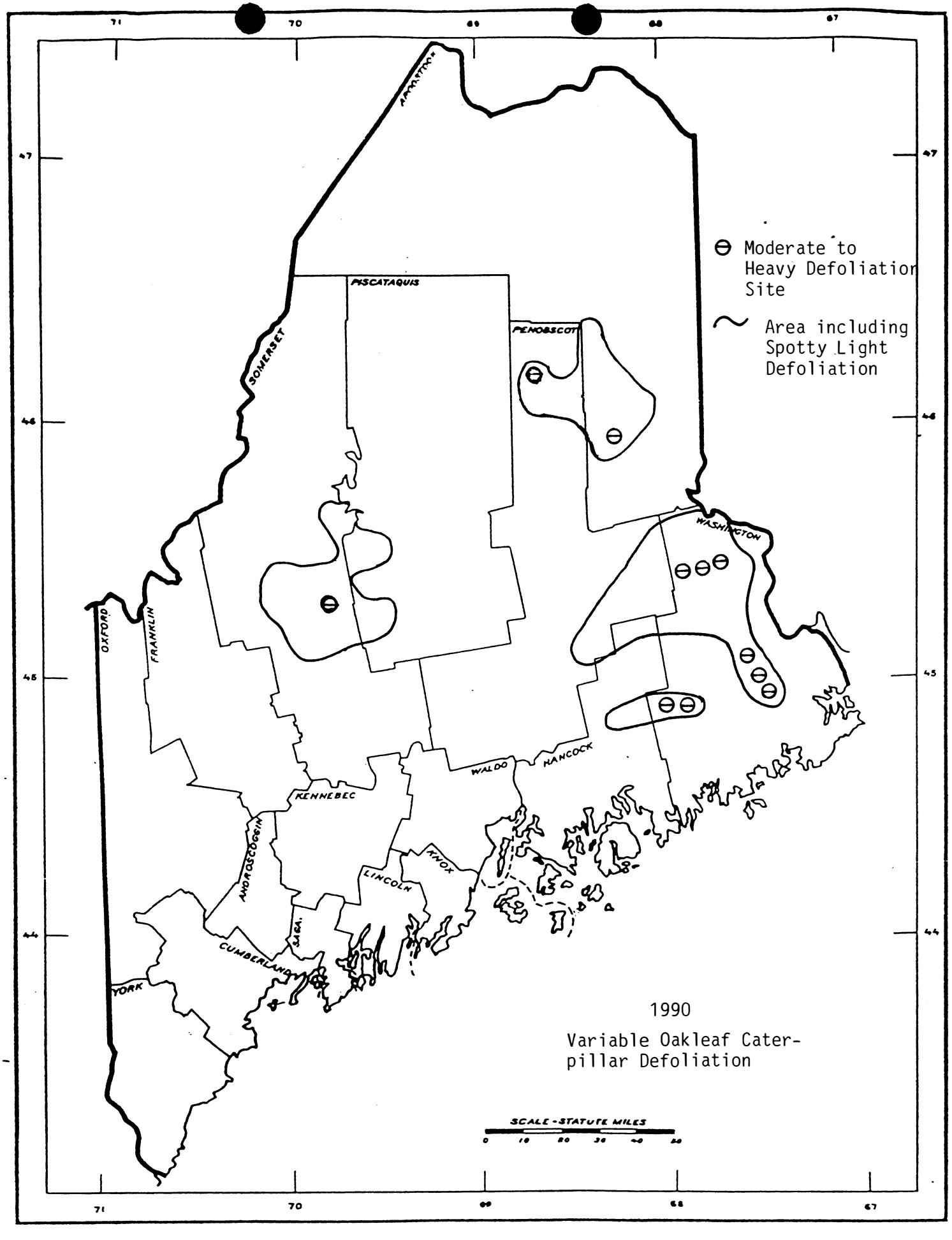
PAST TO PRESENT: Down both in extent and severity.

FUTURE: Expected to continue downward.

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS): None

COMMENTS: In the past, this species has usually been associated with the orange-humped mapleworm. Their combined defoliation was easy to map with aerial surveys as it was more continuous. In 1990 the orangehumped mapleworm had all but disappeared and defoliation was much less striking.

MAINE


Moderate to Heavy Defoliation Site
Area including Spotty Light Defoliation
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OXFORD
FRANKLIN
WALDO
HANCOCK
KENNEBEC
ANDROSCOGGIN
KNOX
LINCOLN
SAG.
CUMBERLAND
YORK
1990
Variable Oakleaf Caterpillar Defoliation
SCALE - STATUTE MILES
0 10 20 30 40 50

1990 PEST CONDITIONS REPORT WORK SHEET

MAINE

PEST - (COMMON NAME): White Birch Decline

(SPECIFIC NAME):

HOST: White birch

PRESENT CONDITION:

AREA - TOTAL ACRES: 34,300 Acres/Rangeley
49,400 Acres/Washington County

LOCATION: Rangelet lakes region and Washington County

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES):
75% of the white birch surveyed in the Rangeley area had dieback within the crown; a mean of 2% new tree mortality was recorded. 94% of the white birch surveyed in Washington County had die back within the crown; All percentages are based on Basal Area within stands.

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):
Recent tree mortality in the Rangeley region had a mean of 2% of the basal area.
Recent tree mortality in the Washington County area had a mean of 5% basal area.

TREND:

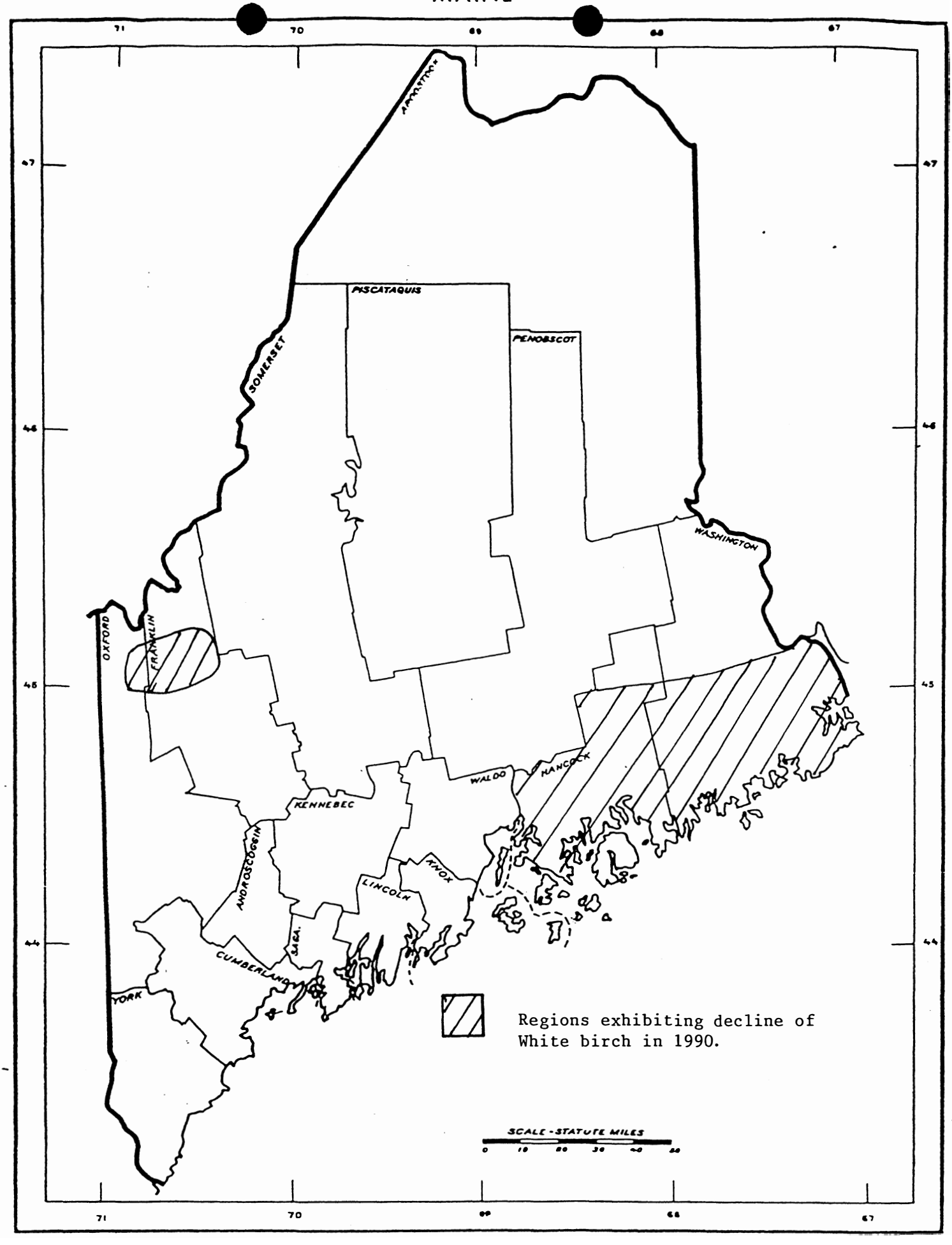
PAST TO PRESENT:
The decline has continued since 1987 and there is no reason to anticipate any change.

FUTURE:

CONTROL PROJECTS - METHOD, MATERIAL, ACRES, COST, RESULTS:
None known - harvesting has taken place in some areas.

COMMENTS:

MAINE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Regions exhibiting decline of White birch in 1990.
SCALE - STATUTE MILES
0 10 20 30 40 50

1990 PEST CONDITIONS REPORT WORK SHEET

MAINE

PEST - (COMMON NAME): White Pine Weevil

(SPECIFIC NAME): Pissodes strobi (Peck)

HOST: Pines and Spruces

PRESENT CONDITION:

AREA - TOTAL ACRES: 418,900 Acres

LOCATION: Statewide

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES):
Uncontrolled acres (95% of total) average 20% attack.

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):
Reductions in growth is significant. Greatest monetary loss due to loss of sawlogs. Resulting pulpwood values are approximately 7% of sawlog value.

TREND:

PAST TO PRESENT:
Damage is expected to remain in the 10-40% infested range within stands.

FUTURE:

CONTROL PROJECTS - METHOD, MATERIAL, ACRES, COST, RESULTS:
Dimilin 4F has been found to be effective at 1-2 oz. AI/ac. Registration is pending.

COMMENTS:

MAINE
1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Annosus Root Rot

(SPECIFIC NAME): Caused by Heterobasidion annosum

HOST: Red Pine, White Pine, Norway Spruce

PRESENT CONDITION: Three new infestations were detected in 1989.

AREA (TOTAL ACRES): Fomes holes are present in red pine plantations with total pine acreage of about 1,000 acres. Within these plantations, areas of tree mortality account for about 25 total acres (the area of fomes holes themselves).

LOCATION: Statewide, except for Aroostook, Hancock, Kennebec, Knox, Sagadahoc and Washington Counties.

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES): Light to moderate, with openings in stands enlarging gradually.

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES): Not quantified

TREND:

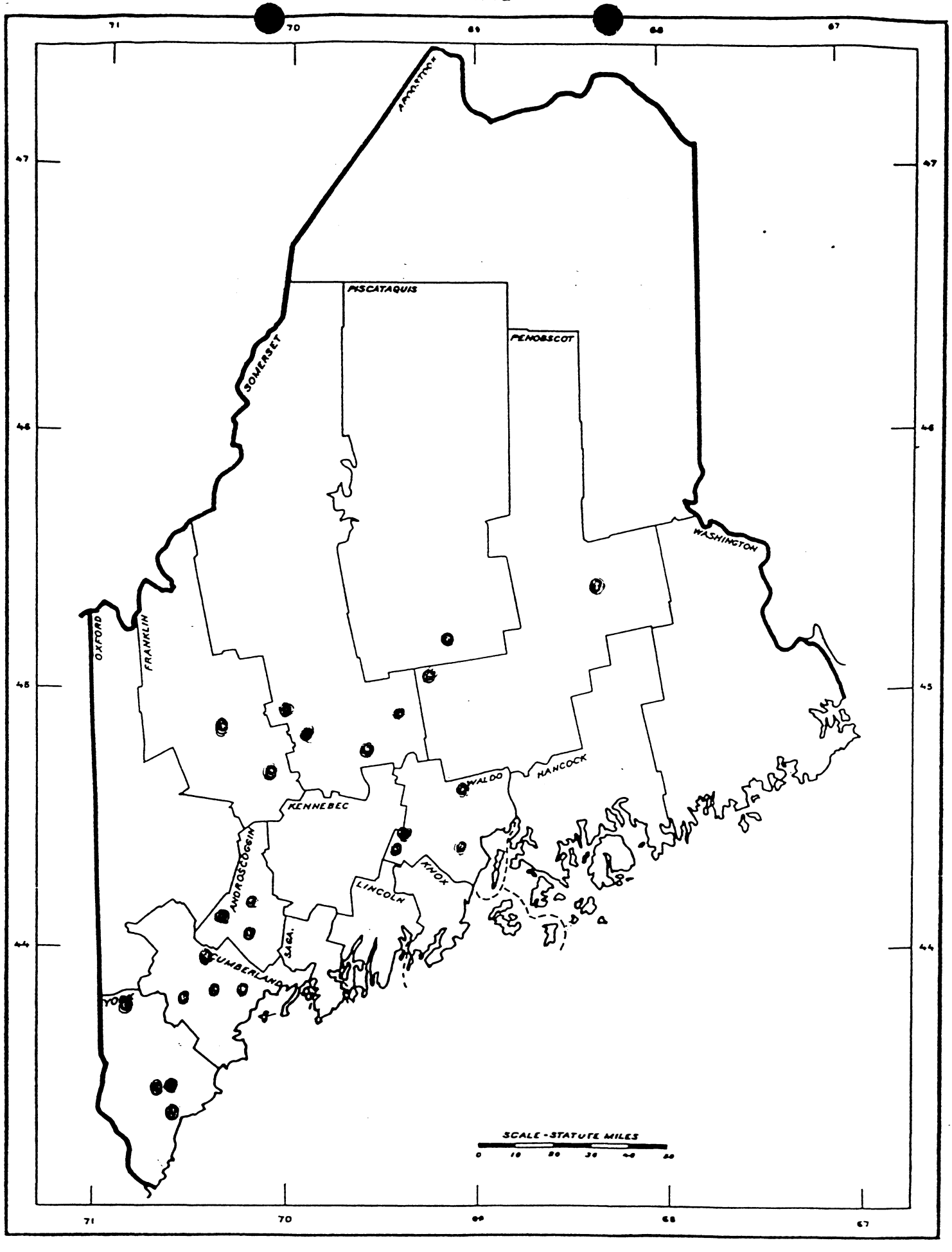
PAST TO PRESENT: Gradually increasing

FUTURE: Gradually increasing

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS): Stump treatment with borax at time of thinnings is recommended to landowners.

COMMENTS: The significance of this disease in Maine is difficult to assess. We recommend stump treatment as a preventative measure, but are not sure that this practice is cost effective.

MAINE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LINCOLN
SAGA.
CUMBERLAND
YORK
SCALE - STATUTE MILES
0 10 20 30 40 50

MAINE

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Ash Dieback and Decline

(SPECIFIC NAME): Cause unknown

HOST: Brown Ash

PRESENT CONDITION:

AREA (TOTAL ACRES): 1,500 (estimated)

LOCATION: Aroostook County, especially along streams and wet areas

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES): Severe dieback and mortality is characteristic of most affected areas.

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES): Not quantified

TREND: Much more severe this year, expected to continue severe in 1991.

PAST TO PRESENT:

FUTURE:

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS): None

COMMENTS: This problem first came to our attention last year, but advanced stages of decline indicate that it has been a problem here for some time.

MAINE

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Balsam Fir Needle Rusts

(SPECIFIC NAME): Caused by several genera of rust fungi

HOST: Balsam Fir

PRESENT CONDITION: Needle rust incidence seemed to be less pronounced in 1990 than in 1989.

AREA (TOTAL ACRES):

LOCATION: Statewide

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES): Light

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES): Marketability of plantation fir for Christmas trees was not seriously affected this year.

TREND: Christmas tree growers are becoming increasingly aware of this problem and are systematically eradicating alternate host plants.

PAST TO PRESENT:

FUTURE:

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS): Control of alternate hosts by growers has been effective. Glyphosate and asulam are the most commonly used herbicides to control alternate host species.

COMMENTS:

MAINE

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Christmas Tree Chlorosis

(SPECIFIC NAME): Manganese deficiency

HOST: Balsam Fir

PRESENT CONDITION:

AREA (TOTAL ACRES): 50 (est.)

LOCATION: China, Norridgewock, Searsmont

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES): Heavy (needle loss) - 5 acres
Moderate (needle chlorosis) - 45 acres

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES): Unsaleable trees - $50,000

TREND: Increasing

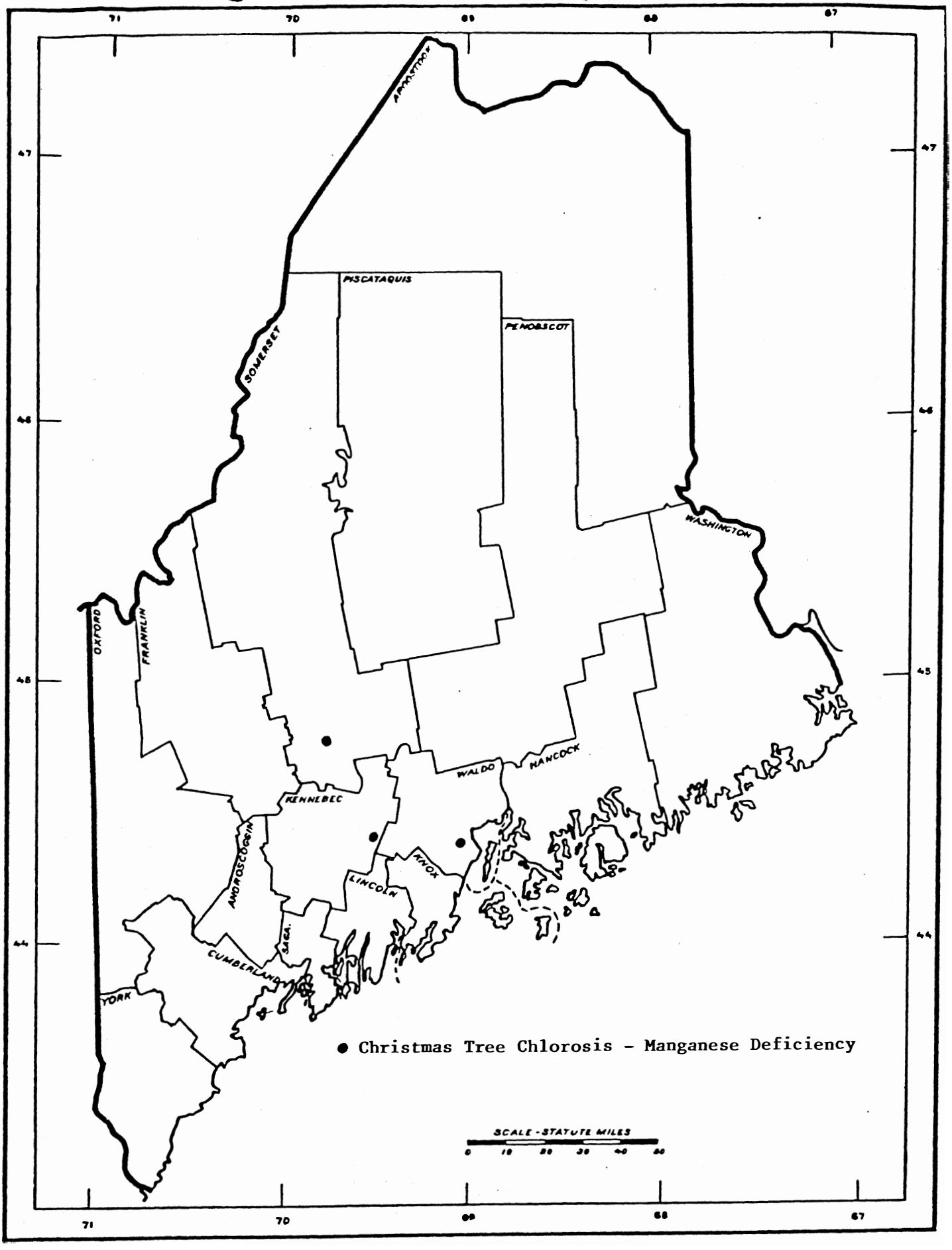
PAST TO PRESENT:

FUTURE:

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS): None

COMMENTS: High soil pH is probably a contributing factor.

MAINE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CUMBERLAND
YORK
● Christmas Tree Chlorosis - Manganese Deficiency
SCALE - STATUTE MILES
0 10 20 30 40 50

MAINE

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Pine - Pine Gall Rust

(SPECIFIC NAME): Endocronartium harknessii

HOST: Scots Pine and Jack Pine (Steuben only)

PRESENT CONDITION:

AREA (TOTAL ACRES): 50 ± Scots Pine
100 ± Jack Pine

LOCATION: 119 MD, Farmington, Mt. Vernon and Steuben (Jack Pine only)

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES): Light - 45; moderate - 5 (Scots Pine)
Moderate to severe - 100 acres (Jack Pine)

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES): Generally light; some branch mortality, but a few seriously infected Christmas trees were destroyed. Loss estimated to be about $1,000. Some mortality of young jack pine in Steuben.

TREND: Static

PAST TO PRESENT:

FUTURE:

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

COMMENTS: The jack pine in Steuben has been infected for some time and galls are very abundant on some trees, on both branches and main stems. This area is beginning to undergo development stimulating more concern for the aesthetic aspect of the problem.

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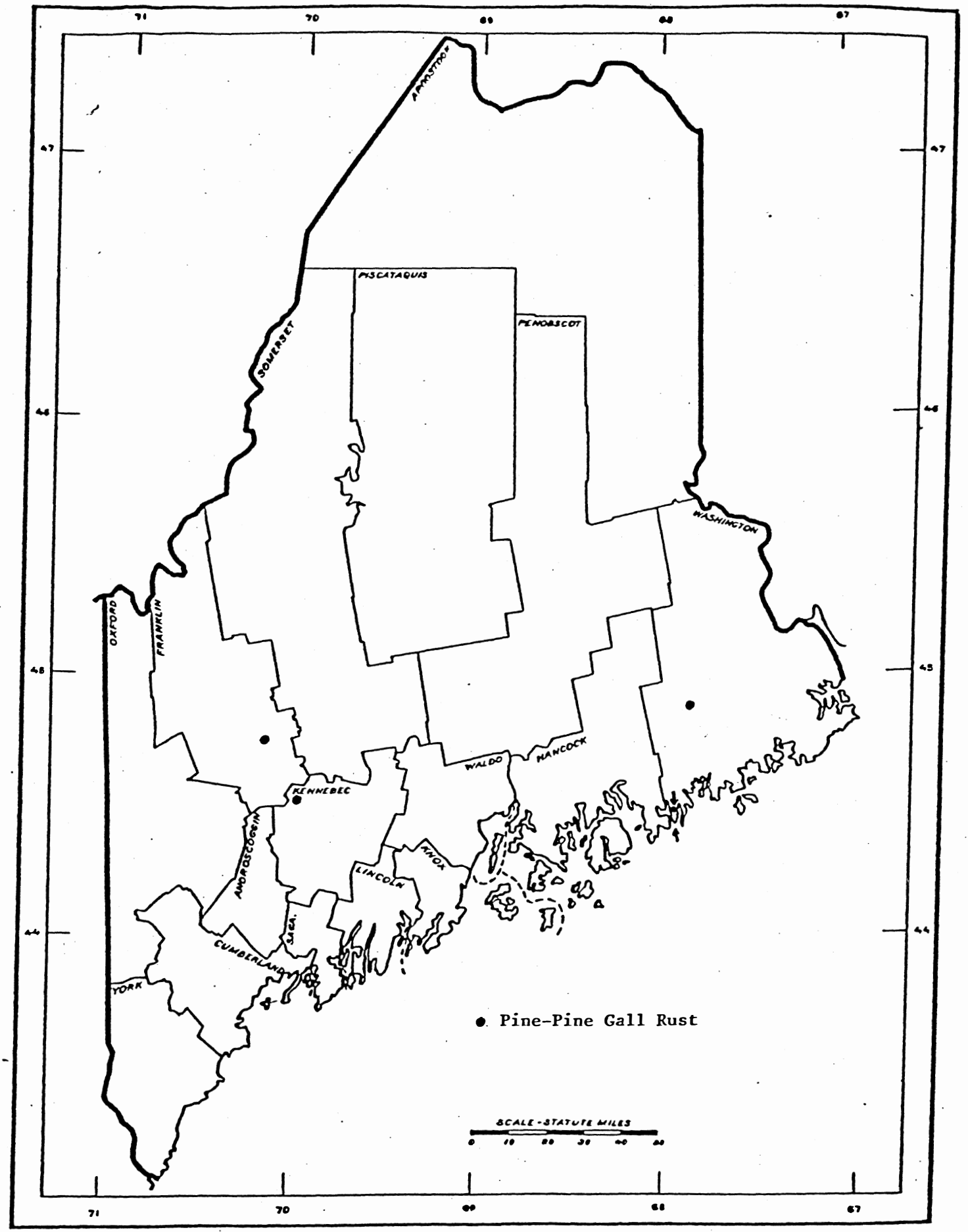
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YORK
● Pine-Pine Gall Rust
SCALE - STATUTE MILES
0 10 20 30 40 50

MAINE

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Scleroderris Canker

(SPECIFIC NAME): Caused by Ascocalyx abietina

HOST: Red Pine

PRESENT CONDITION:

AREA (TOTAL ACRES): 1

LOCATION: Eustis

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES): Scattered infections on trees at a previously recorded site.

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES): No significant mortality

TREND: Static; no new infection sites reported this year.

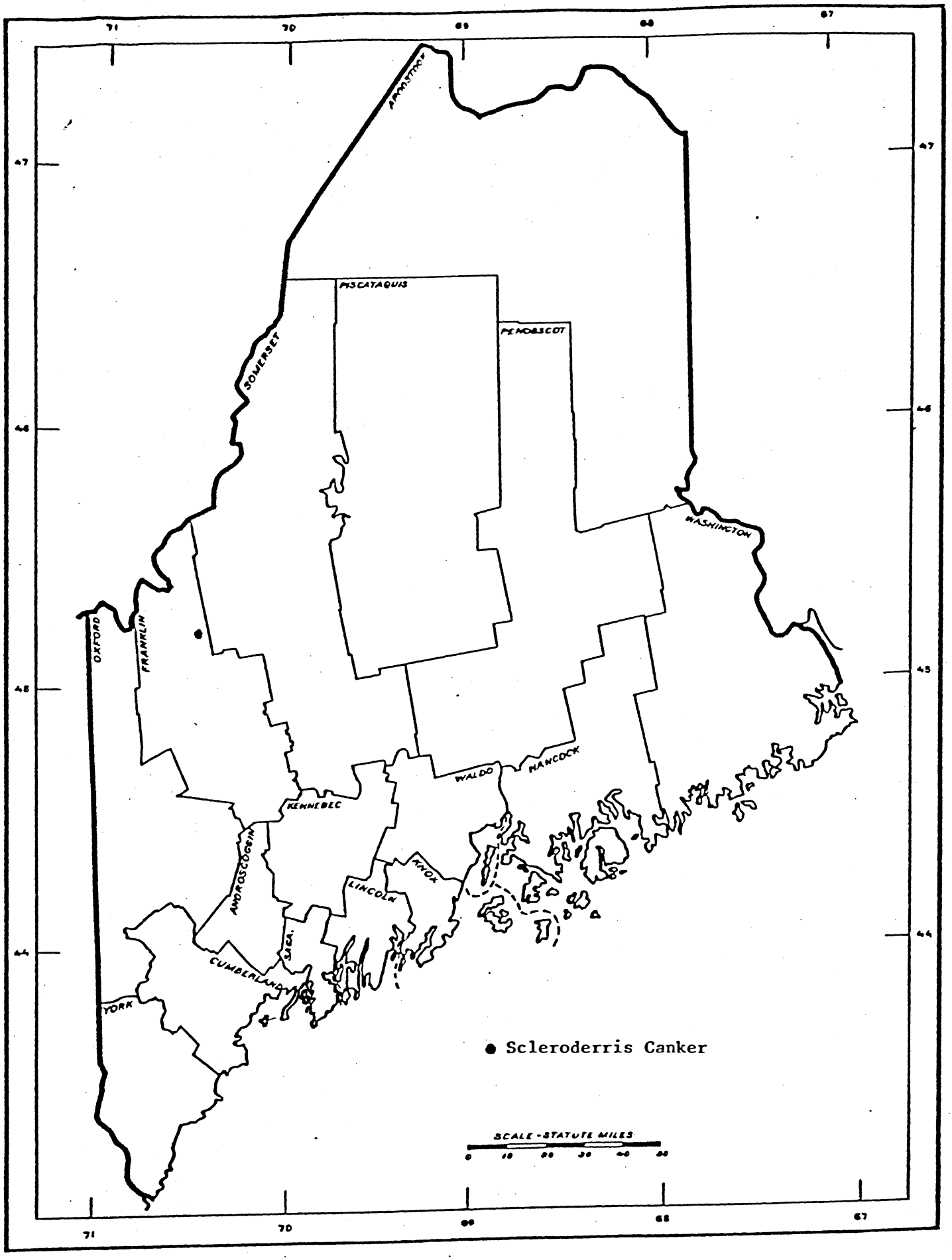
PAST TO PRESENT:

FUTURE:

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS): No control projects in 1990.

COMMENTS: This does not appear to be a serious disease in Maine at the present time.

MAINE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CUMBERLAND
YORK
● Scleroderris Canker
SCALE - STATUTE MILES
0 10 20 30 40 50

MAINE

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Sirococcus Shoot Blight

(SPECIFIC NAME): Sirococcus conigenus

HOST: Red Pine, Blue Spruce

PRESENT CONDITION:

AREA (TOTAL ACRES): Statewide

LOCATION: Wild stands, plantations, and individual landscape trees affected statewide.

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES): One plantation (about 10 acres) is about to be totally lost. Other areas less severely affected.

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES): Not quantified

TREND: Infection of ornamental spruce was less pronounced in 1990, but infected trees in red pine plantations show continuing mortality and decline.

PAST TO PRESENT:

FUTURE:

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS): None

COMMENTS:

MAINE

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): White Pine Blister Rust

(SPECIFIC NAME): Caused by Cronartium ribicola

HOST: E. White Pine

PRESENT CONDITION:

AREA (TOTAL ACRES): Statewide

LOCATION:

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES): Estimated 3.8% loss in control areas over a 10 year period; estimated 9.1% loss in noncontrol areas over a 10 year period.

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES): Annual loss about $100,000

TREND: Static

PAST TO PRESENT:

FUTURE:

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS): 54 acres concentrated ribes (Tordon RTU) 5,998 acres scattered ribes (Tordon RTU)

COMMENTS: We have initiated tests to investigate Garlon (trichlopyr) as an alternative to Tordon. Preliminary results are promising.

MAINE

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Winter Injury

(SPECIFIC NAME): abiotic

HOST: Many species of native and introduced conifers, especially Scotch pine.

PRESENT CONDITION:

AREA (TOTAL ACRES): Not quantified

LOCATION: Statewide

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES): Light to moderate damage to most species but heavy damage to Scotch pine (many Christmas trees were rendered unmerchantable)

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES): Not quantified

TREND: No trends apparent

PAST TO PRESENT:

FUTURE:

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS): None

COMMENTS: Most of this damage can be attributed to the early and protracted cold weather of December 1989.

STATE OF NEW HAMPSHIRE
DEPARTMENT of RESOURCES and ECONOMIC DEVELOPMENT
DIVISION OF FORESTS AND LANDS
172 Pembroke Road P.O. Box 856 Concord, New Hampshire 03301
John E. Sargent, Director

STEPHEN K. RICE
Commissioner

603-271-2214
FAX: 603-271-2629

DEC 21 1990

December 18, 1990

James Linnane
USFS, NA-S&PF
Concord and Mast Roads
Post Office Box 640
Durham, NH 03824

Dear Jim:

Enclosed is the 1990 Forest Insect and Disease Conditions Report for New Hampshire.

Highlights of conditions in this state were affected by budget cutbacks again this year. At the end of the summer, I lost my only Insect and Disease Technician position. However, while it was filled, we were able to begin catching up on some of the work plan objectives.

Hemlock Wooly Adelgid - apparently has not yet reached our state borders. Thirty-one (31) permanent detection plots were examined this year with no evidence of infestation found. Also no infested nursery stock or stock shipped into the state was found to be harboring this pest. Systematic detection surveys for this pest were started in 1988. Lack of funds and personnel prevented conduct of the survey in 1989. The finding of no Hemlock Wooly Adelgid in 1990 was greeted with great cheer this year.

Pear Thrips - population failed to materialize again this year, making it our second year without receiving any reports of this insect. We did participate in Bruce Parker's Regional Pear Thrips Soil Sampling Project by delivering 110 soil plug samples from the area involved with our 1988 Pear Thrips Spray Project. This project was cancelled when the predicted spring population failed to materialize.

Gypsy Moth - continued to expand this year with the help of spring winds at the time of larval emergence. The dispersal of first instar larvae supplemented the building resident populations throughout the southern half of the state and resulted in 133,450 acres of moderate to heavy defoliation. Evidence of NPV and the Entomophaga fungus topped off late instar larvae with the result that very few starvation-stressed populations were observed or reported throughout the defoliated areas this year.

During the last two (2) years, I have been taking length measurements of egg masses to estimate defoliation potentials based on Moore and Jones Field Estimation of Fecundity of Gypsy Moth published in Environmental Entomology, 16:165-167 (1987). I compared measurements of 320 egg masses taken in 1989 and 610 egg masses taken in 1990. Average egg mass length reflected a 25 percent reduction. Estimated number of eggs per mass by Moore and Jones formula gave a 33 percent reduction from the 1989 estimate. Average 1990 moth catch per trap, based on 75 sites showed no change from the 1989 catch.

Interpretation of the data at this time leaves the question of next year's potential very much up in the air. Early egg mass collections to determine percent hatch may provide a more valid guesstimate before next spring.

Happy Holidays,

Alfred C. Avery
Forest Entomologist

ACA:sp
enc.

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Gypsy Moth

(SPECIFIC NAME): Lymantria dispar (Linnaeus)

HOST: Various hardwoods with strong preference for oak.

PRESENT CONDITION: Populations have been building and spreading for the last three years. The Entomophaga fungus was observed at 2/3rds of the 95 EM survey sites.

AREA (TOTAL ACRES): 133,450 acres of moderate to heavy defoliation.

LOCATION: All ten (10) Counties received some mod./heavy defoliation with Cheshire, Merrimack, Grafton and Carroll counties receiving the bulk of defoliation.

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES):

During the aerial survey all defoliation greater than 30% was sketched without any distinction between moderate (30-60%) and heavy (60 -100%).

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

None observed.

TREND:

PAST TO PRESENT: Increased in 1990; 135 infestation sites in 1990 jumped to 311 sites, each site had moderate to heavy defoliation.

FUTURE: Unchanging from 1990 or decreasing in '91. Mixed signals from population surveys, i.e., average egg-mass-per-acre count dropped 21% from the '89 average; moth catch per trap remained unchanged from the '89 catch.

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

1600 acre managed area proposed for 1991.

COMMENTS:

None.

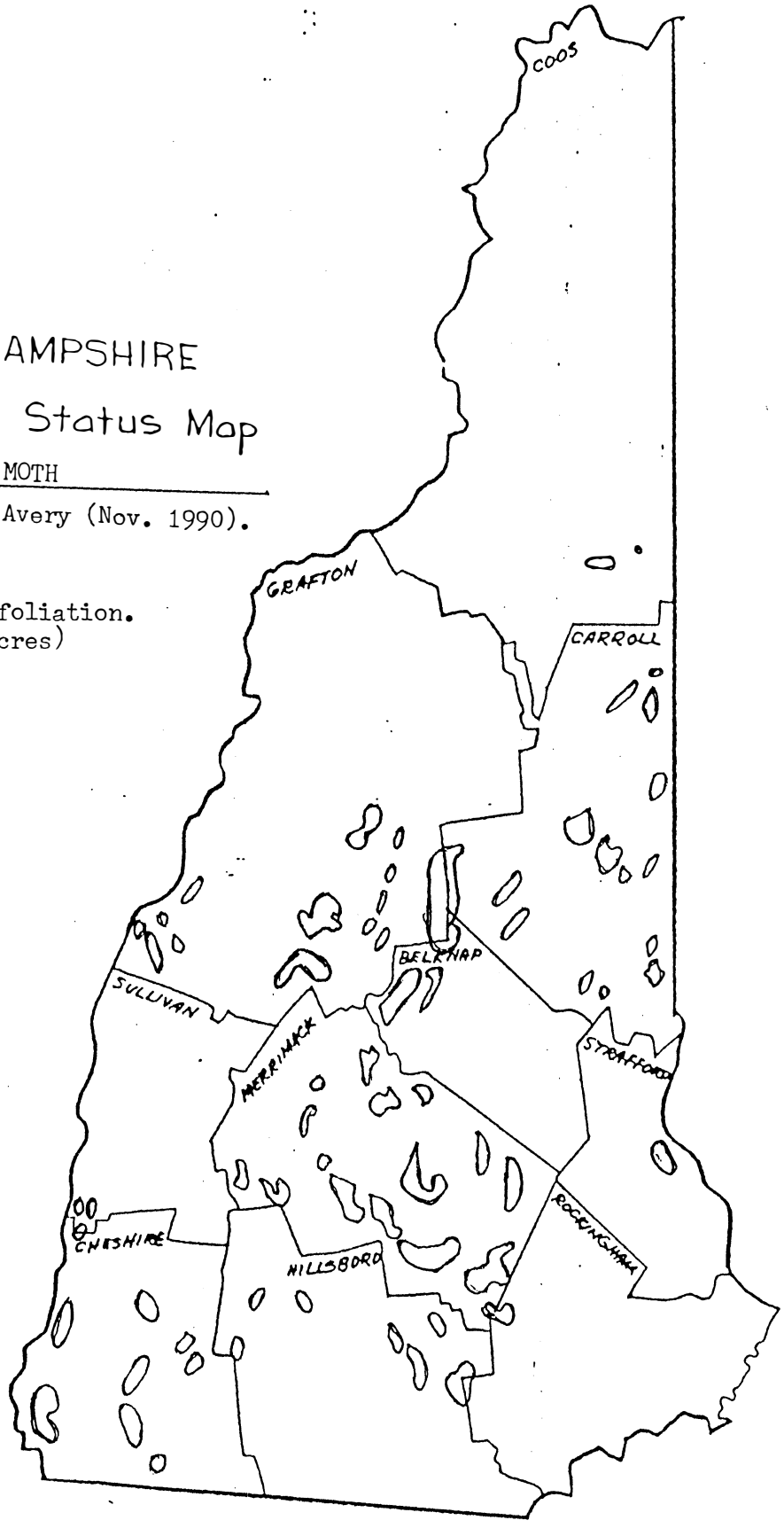
NEW HAMPSHIRE

Forest Pest Status Map

Pest: GYPSY MOTH

prepared by Al Avery (Nov. 1990).

Area of defoliation.
(133,450 acres)



Year: 1990

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Oak Leaftier

(SPECIFIC NAME): Croesia semipurpurana (Kearfott)

HOST: Red Oak

PRESENT CONDITION: populations appear to be at the lowest level since we began to survey for this pest.

AREA (TOTAL ACRES): 16,160 acres in SW corner of the State.

LOCATION:

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES):

No areas of defoliation caused by the Oak Leaftier were observed on this year's flight.
Egg counts in 1990 are the lowest to date.

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

None.

TREND:

PAST TO PRESENT: Continues to decline.

FUTURE: Continued endemic levels.

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

None.

COMMENTS:

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Hemlock Woolly Adelgid

(SPECIFIC NAME): Adelges tsugae Annand

HOST: Hemlock

PRESENT CONDITION: No evidence of infestation found in N.H.

AREA (TOTAL ACRES): 162,700 acres involving hemlock stands within

LOCATION: 50 miles of the seacoast in southeastern N. H.

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES):

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

TREND: HWA has not been discovered to date, including on nursery stock shipped into the state.

PAST TO PRESENT:

FUTURE:

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

COMMENTS:

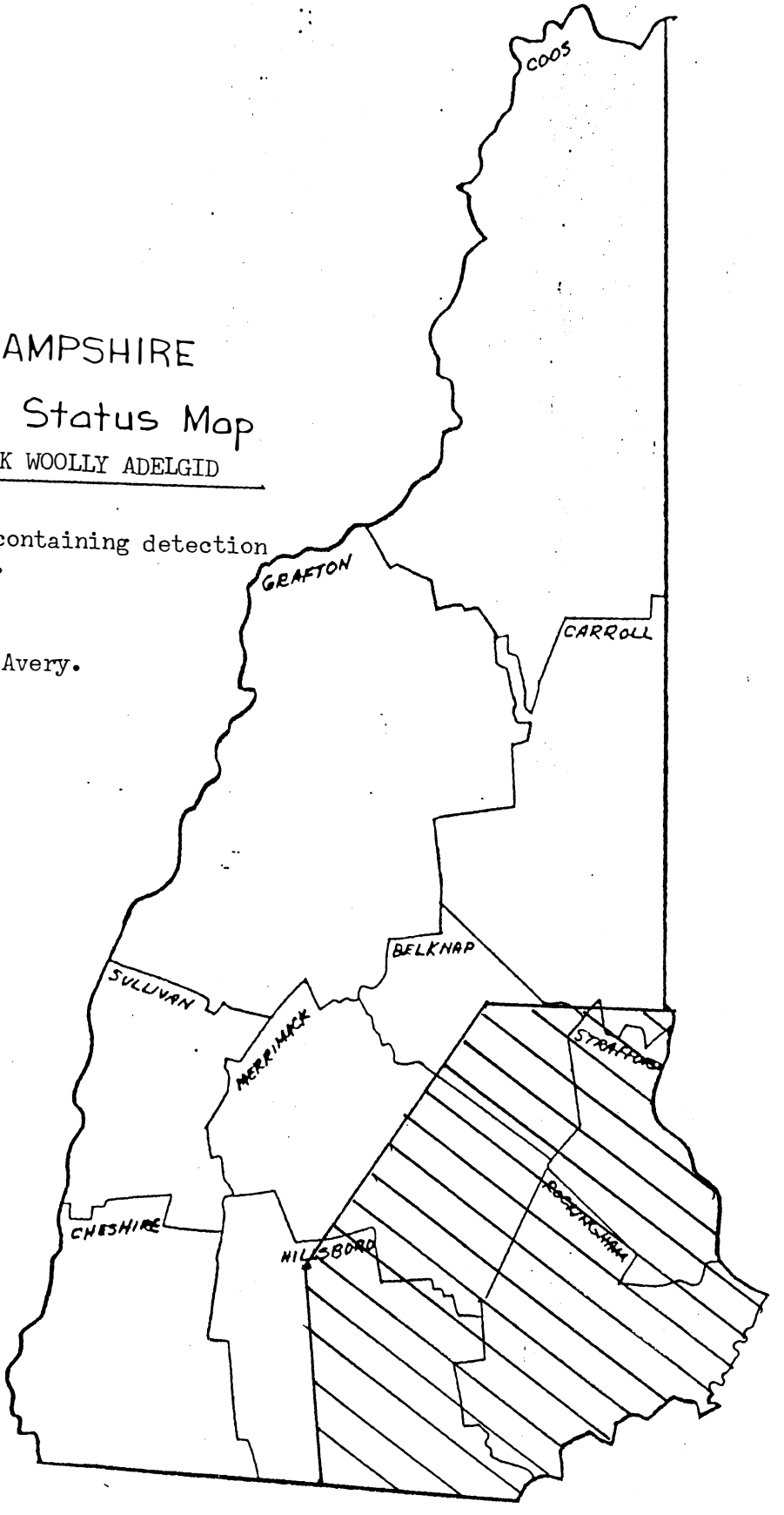
NEW HAMPSHIRE

Forest Pest Status Map

Pest: HEMLOCK WOOLLY ADELGID

Area containing detection plots.

prepared by Al Avery.
November 1990.



Year: 1990

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Gypsy Moth

(SPECIFIC NAME): Lymantria dispar

HOST: OAK

PRESENT CONDITION:

AREA (TOTAL ACRES): 9980

LOCATION: White Mountain Nat. For.

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES):

Moderate (31-60% defoliation) — ~~6323~~ 2481 acres

Severe (>60% defoliation) — 6323 acres

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

TREND:

PAST TO PRESENT: 1990 was the peak year for Gypsy Moth on the WMNF. Evans Notch, Saco, Sm portion Andro.

FUTURE: The population is on the decline for 1991

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

NONE

COMMENTS:

presence of disease (NPV ~~and/or~~ fungus) in population.

NY

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-4253

Thomas C. Jorling
Commissioner

December 11, 1990

Mr. James P. Linnane
US Department of Agriculture
Cor. Concord & Mast Roads
P.O. Box 640
Durham, New Hampshire 03824

Dear Mr. Linnane:

Enclosed are completed forms and maps. These records describe some important forest health problems in New York State. The information transmitted herein should be used in compiling your National and Area Pest Condition's Report.

Since documents rarely are comprehensive or clear enough to capture everything that Dennis may need to compile the Forest Service report, please extend my offer to provide any additional information he may require.

Sincerely,

Michael J. Birmingham
Associate Forester

Enclosures

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): [redacted]

(SPECIFIC NAME):

HOST:
sugar maple and black cherry

PRESENT CONDITION:

AREA (TOTAL ACRES): 100,000 acres

LOCATION:

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES):

primarily in eastern Delaware County

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

moderate

TREND:

PAST TO PRESENT: decline

FUTURE:

stable

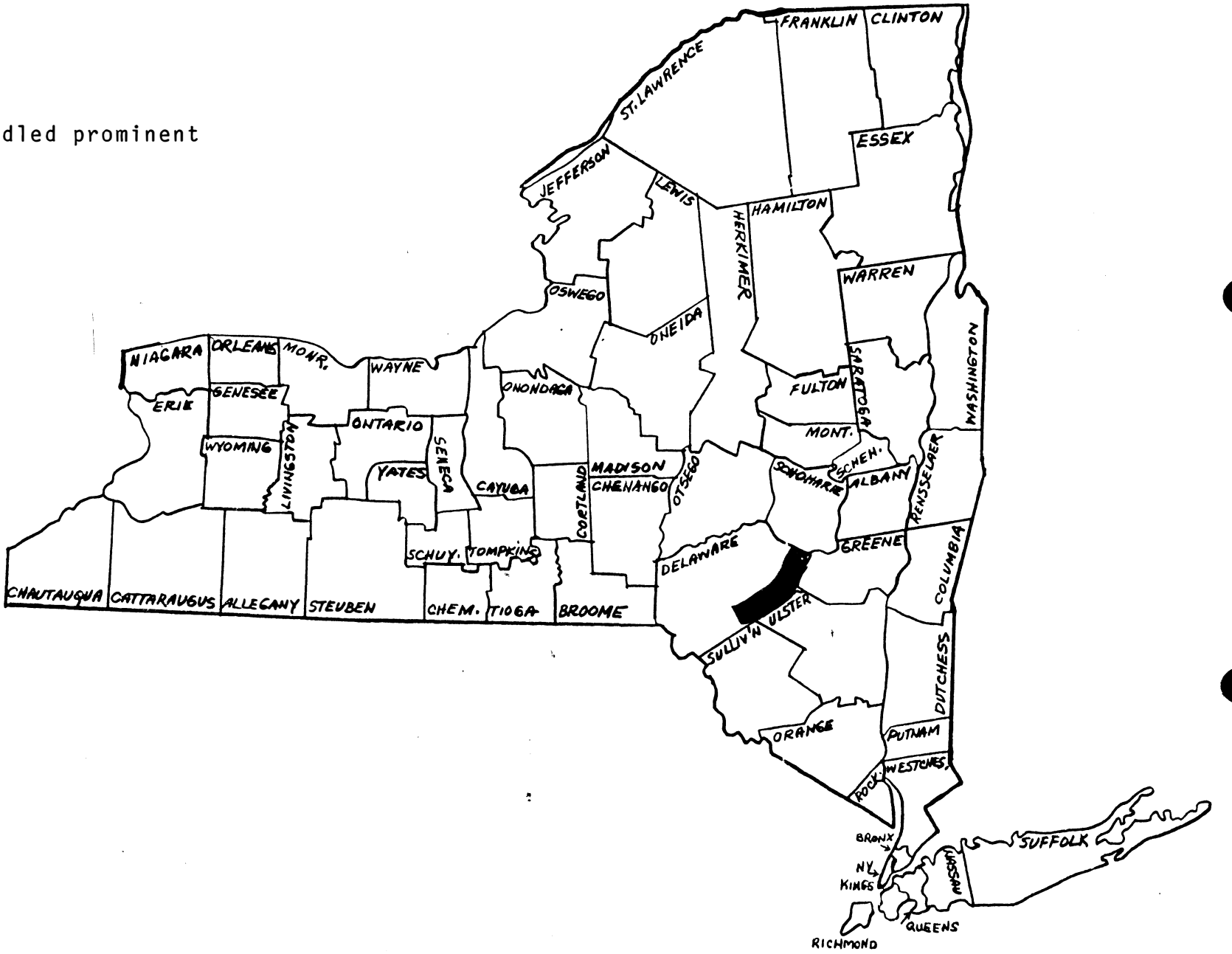
CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

aerial sprays

COMMENTS:

An explosive buildup of the insect in 1989 followed by an equally explosive dieoff of larvae. The dieoff occurred in the same year as the outbreak. The cause of dieoff was a larval disease in the fungus class.

Saddled prominent



NEW YORK

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): [redacted]

(SPECIFIC NAME):

HOST:
black cherry

PRESENT CONDITION:

AREA (TOTAL ACRES):
not computed

LOCATION:

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES):

Rensselaer C ounty

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

none

TREND:

PAST TO PRESENT:
The fastest buildup of population since the 1970's

FUTURE:

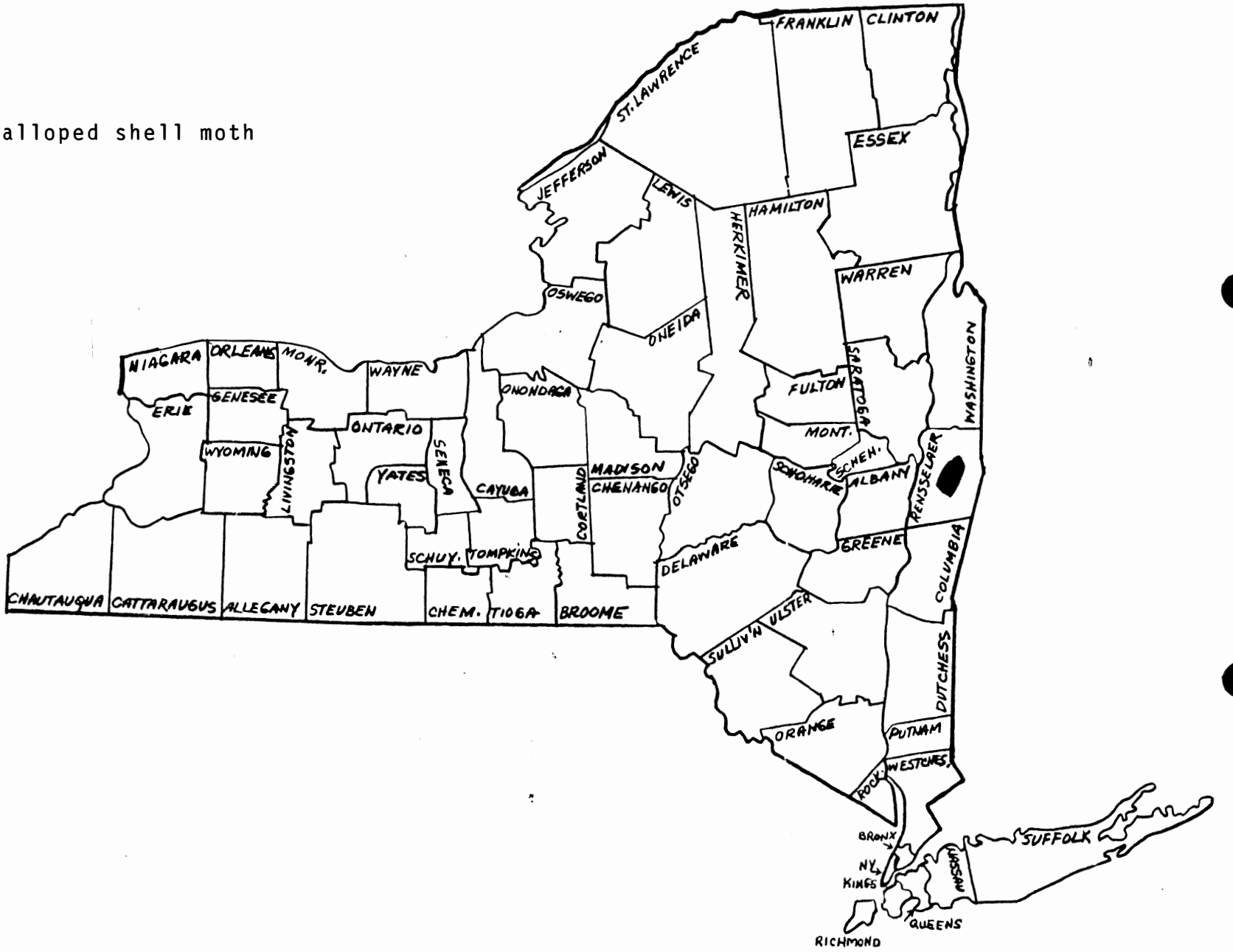
unknown

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

none

COMMENTS:
Enormous foliage damage in regions of Rensselaer County between Route 2, Grafton State Park, Cherry Plains State park and Poestenkill. Trees appeared as scorched. Calls from anxious park officials and public. No evidence of parasitism.

Cherry scalloped shell moth



NEW YORK

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): [redacted]

(SPECIFIC NAME):

HOST:

sugar maples and black cherry

PRESENT CONDITION:

AREA (TOTAL ACRES):

none

LOCATION:

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES):

Jefferson County

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

none

TREND:

PAST TO PRESENT:

decline

FUTURE:

stable at low populations

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

aerial sprays of sugar bushes and valuable sugar maple woodlots

COMMENTS:

Heavy population last year destroyed by disease and pupal parasitism.

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME):

(SPECIFIC NAME): [redacted]

HOST:

white ash

PRESENT CONDITION:

AREA (TOTAL ACRES):

statewide

LOCATION:

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES):

ranges from little damage to complete ash stands dying.

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

unknown

TREND:

PAST TO PRESENT: stable at high levels

FUTURE:

continuation of high infection rates.
Ash continues to comeback in large numbers on inactive agricultural lands.

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

none but timely salvage.

COMMENTS:

Ash dieback is largely the result of ash yellows disease. The disease continues for more than 30 years to take an enormous toll of ashes. About 80 percent of the white ash found dead are killed by ash yellows, which produces a witches broom. The remaining 20 percent of mortality is caused by unknown factors.

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): [redacted]

(SPECIFIC NAME):

HOST:

maples

PRESENT CONDITION:

AREA (TOTAL ACRES): statewide

LOCATION:

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES):

light throughout New York

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

Some mortality from prior years of infestation, but mortality scattered and usually associated with other stress induced causes such as logging and resultant site damage.

TREND:

PAST TO PRESENT:

decline

FUTURE:

become stable at low populations levels with occassional outbreaks.

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

none recommended

COMMENTS:

This insect was spectacular in 1985 and as recently as 1989. But a disease appears to have destroyed the population as reported by Vermont researchers. Populations conti guous with Vermont within New York State colapsed at the same time as did those in Vermont. Also, unexplained is the large numbers of thrips observed in maple buds that failed to produce maple leaf symptoms.

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): [redacted]

(SPECIFIC NAME):

HOST:

butternut

PRESENT CONDITION:

AREA (TOTAL ACRES):

LOCATION: statewide

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES):

a tree killer

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

nearly all mature butternut in New York killed.

TREND:

PAST TO PRESENT:

increased

FUTURE:

decline as butternut disappears throughout the state.

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

unknown

COMMENTS:

This disease caused little attention. Butternut is not a particularly important species for wood products. Until the tree appeared on the Federal list of potential endangered species, little was heard or reported on the disease. In field inspections, I have noted most butternut trees have a canker or had died.

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): [redacted]

(SPECIFIC NAME):

HOST:
Norway maple

PRESENT CONDITION:

AREA (TOTAL ACRES):
unknown

LOCATION:

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES):

sporadic

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

none

TREND:

PAST TO PRESENT:
rapid increase in acreage

FUTURE:
spread throughout New York

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

none tried or reported

COMMENTS:

First reported in Erie and Herkimer Counties, the leaf disease occurred in widely scattered locations in New York. Severe infections resulted in premature leaf drop and blighting of Norway maples. Large tar spot disease, favored by prolong wet spring and summer was from the public's view point one of the most spectacular pest problems in 1990.

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): [redacted]

(SPECIFIC NAME):

HOST: Red, Scotch and eastern white pines

PRESENT CONDITION:

AREA (TOTAL ACRES): 4,400

LOCATION: northwestern Adirondacks

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES):

4,400 acres of combined heavy and moderate damage.

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

not computed

TREND:

PAST TO PRESENT: increasing

FUTURE:

additional acreage. Currently increasing at an accelerating rate.

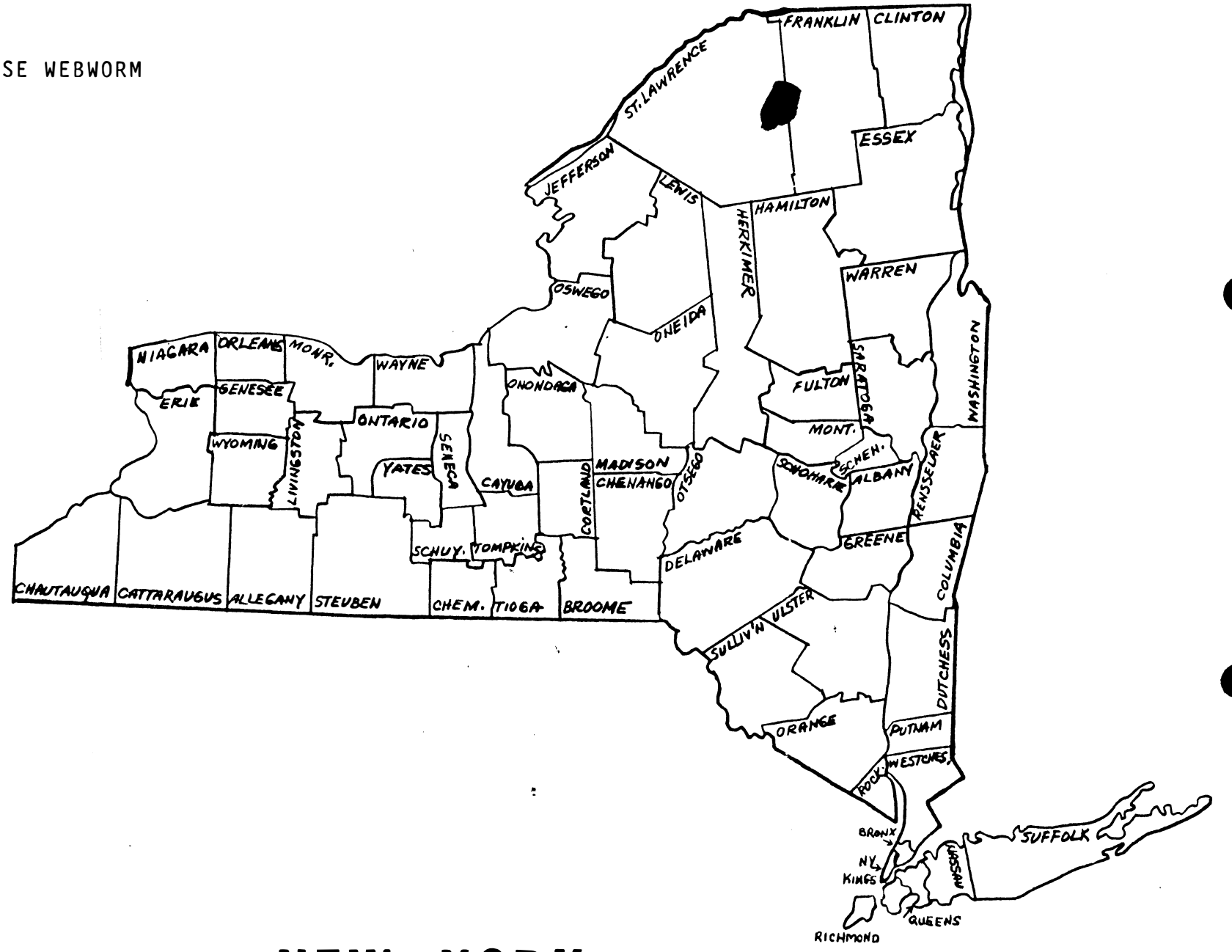
CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

Christmas tree growers applying annual insecticidal applications to control the insect's damage.

COMMENTS:

We have applied for special project moneys from the US Forest Service. These moneys would fund needed research on the insect's biology and its impacts on host trees.

PINE FALSE WEBWORM



NEW YORK

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): [redacted]

(SPECIFIC NAME):

HOST: sycamore

PRESENT CONDITION:

AREA (TOTAL ACRES): not computed

LOCATION: southeastern New York and Capital District Region

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES):

complete defoliation of shade and wild sycamores

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

None.

TREND:

PAST TO PRESENT: In the past two years, the tend has increased.

FUTURE: Expect declines.

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

Sprays help reduce anthracnose infections.

COMMENTS:

This year and last are the two worst years for anthranose twig and leaf infections in 25 years, as long back as there is records or memory of this disease. Two consecutive wet springs and summers are responsible for the high rates of infections.

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): [redacted]

(SPECIFIC NAME):

HOST:

eastern hemlock

PRESENT CONDITION:

AREA (TOTAL ACRES):

not computed

LOCATION:

southeastern New York.

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES):

Scale populations as high as 10 scales per needle.

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

Mortality of hemlock not attributed to needle scales. In combination with adelgids, needle scales may hassen hemlock mortality.

TREND:

PAST TO PRESENT:

Stable

FUTURE:

stable or declining. The primary locations where the needle scales occur is where the adelgid also occurs.

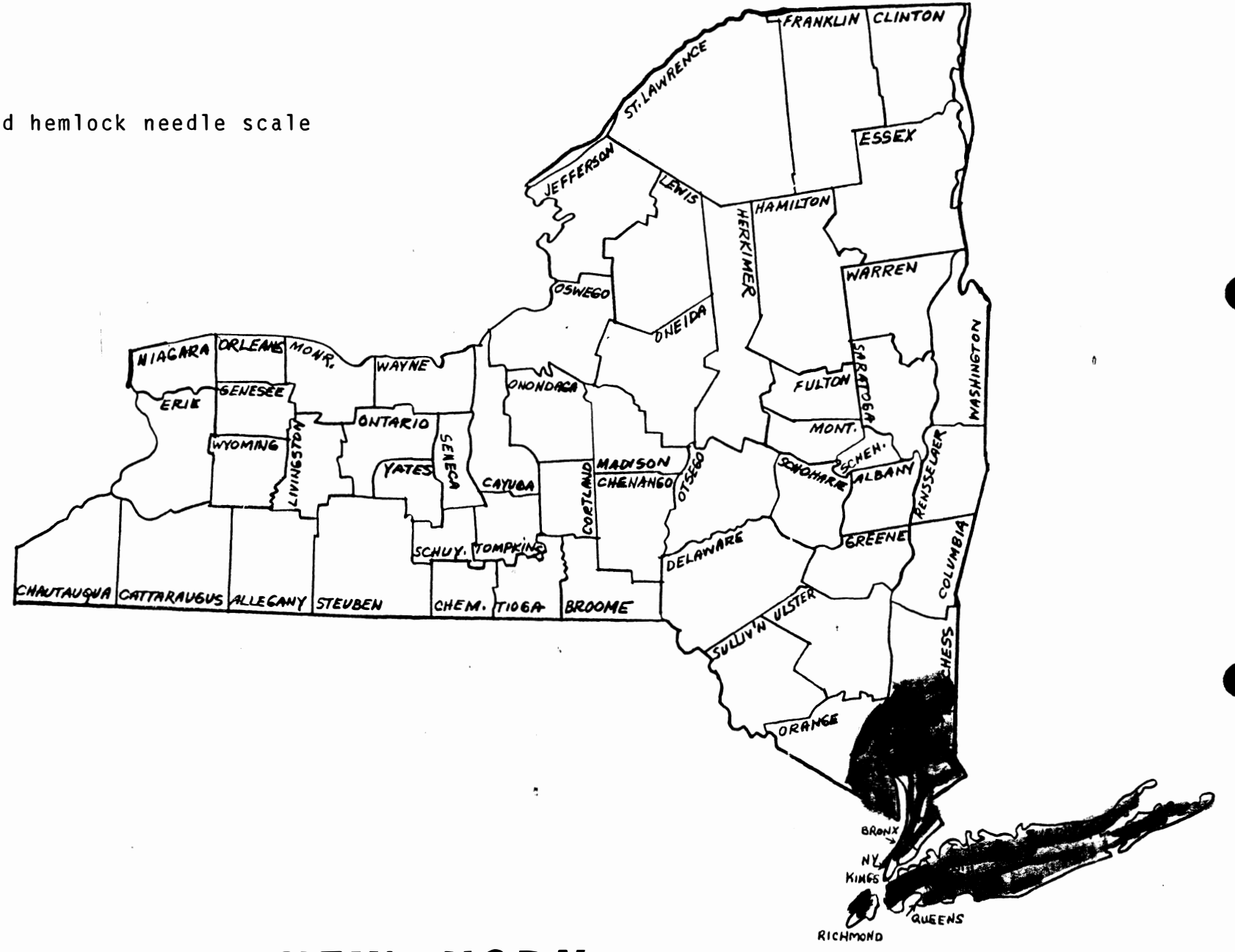
CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

Suffocants work well to suppress needle scales.

COMMENTS:

Needle scales are so heavy that they color the hemlocks a whitish color. Heavily infested hemlocks have thin, yellowing crowns. Some scientist believe that hemlocks die only when they are first weakened by the needle scales and then attacked by the adelgid. As the adelgid moves northward in New York, out of the needle scale's range, then a comparison can be made between hemlocks infested with needle scale and adelgids and those solely infested with the adelgid.

Elongated hemlock needle scale



NEW YORK

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): [redacted]

(SPECIFIC NAME):

HOST:
red pine

PRESENT CONDITION:

AREA (TOTAL ACRES): not computed

LOCATION: southeastern New York

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES):

Mortality occurs in all infested counties

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

Volumn of loss unknown

TREND:

PAST TO PRESENT:
Scale population declining.

FUTURE:
Futher declines.

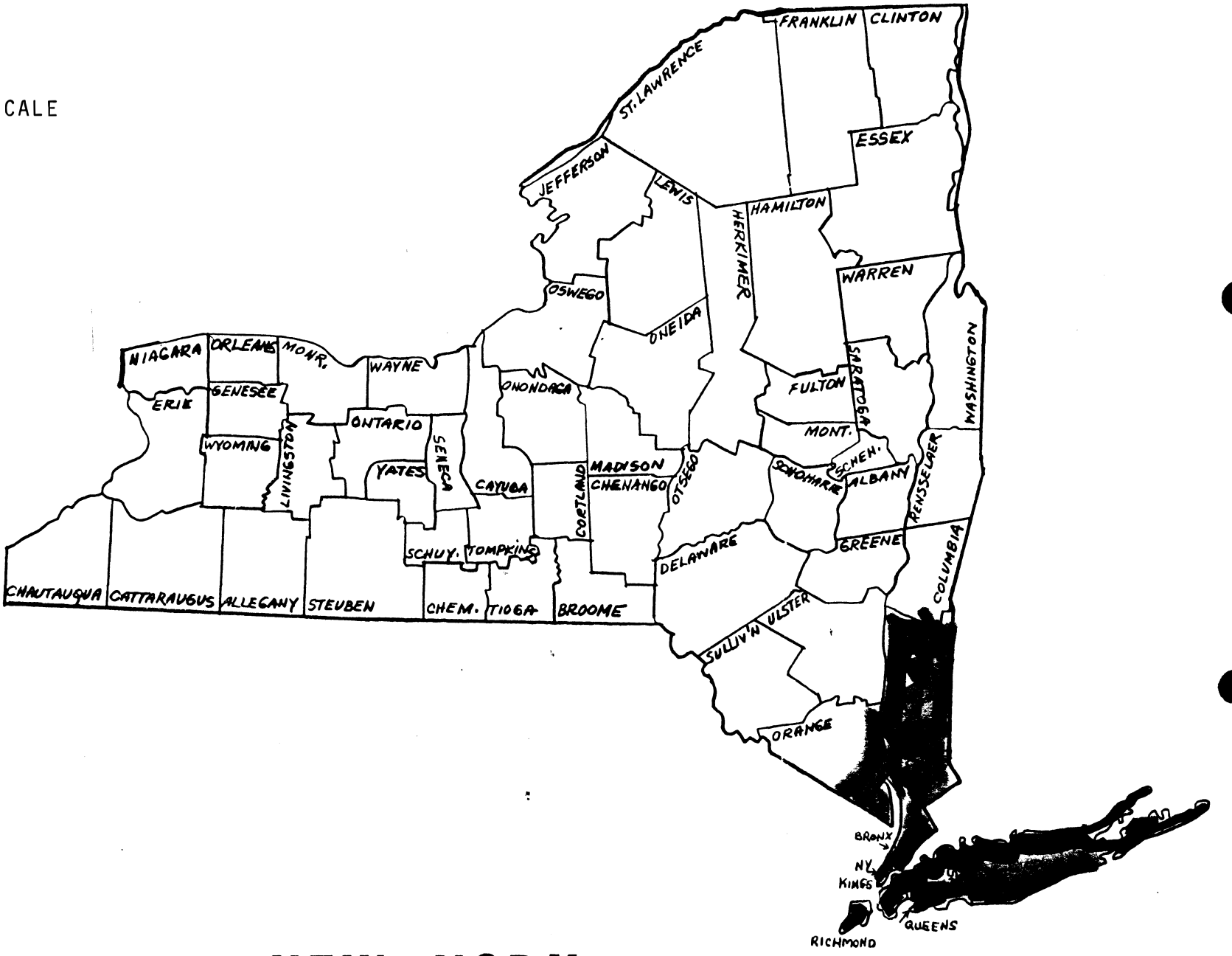
CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

Non. Infested pine salvaged.

COMMENTS:
Red pine scale is declining due to the decline in numbers of red pine. Red pine declined due to reaching biological maturity on heavy soils typical of this region of the state, namely the soils north of New York City to the east and west of the Hudson River within the Hudson River Valley.

Red pine plantations have declined in acreage due to toppling of pines from wind and breakage. There are few pine plantations south of Columbia County on the eastside of the Hudson River. There is little scale population on the westside of the Hudson River.

RED PINE SCALE



NEW YORK

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): [redacted]

(SPECIFIC NAME):

HOST: Eastern Hemlock

PRESENT CONDITION:

AREA (TOTAL ACRES): Not computed

LOCATION: southeastern New York

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES):

Heavy mortality in Westchester, Putnam, Rockland and Orange Counties. Moderate mortality in above counties - no acreage figures computed.

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

Unknown volumn of hemlock killed.

TREND:

PAST TO PRESENT:

Increased acreage infested; increased mortality since the first infestation discovered in New York in 1987.

FUTURE:

Mortality and acreage will increase.

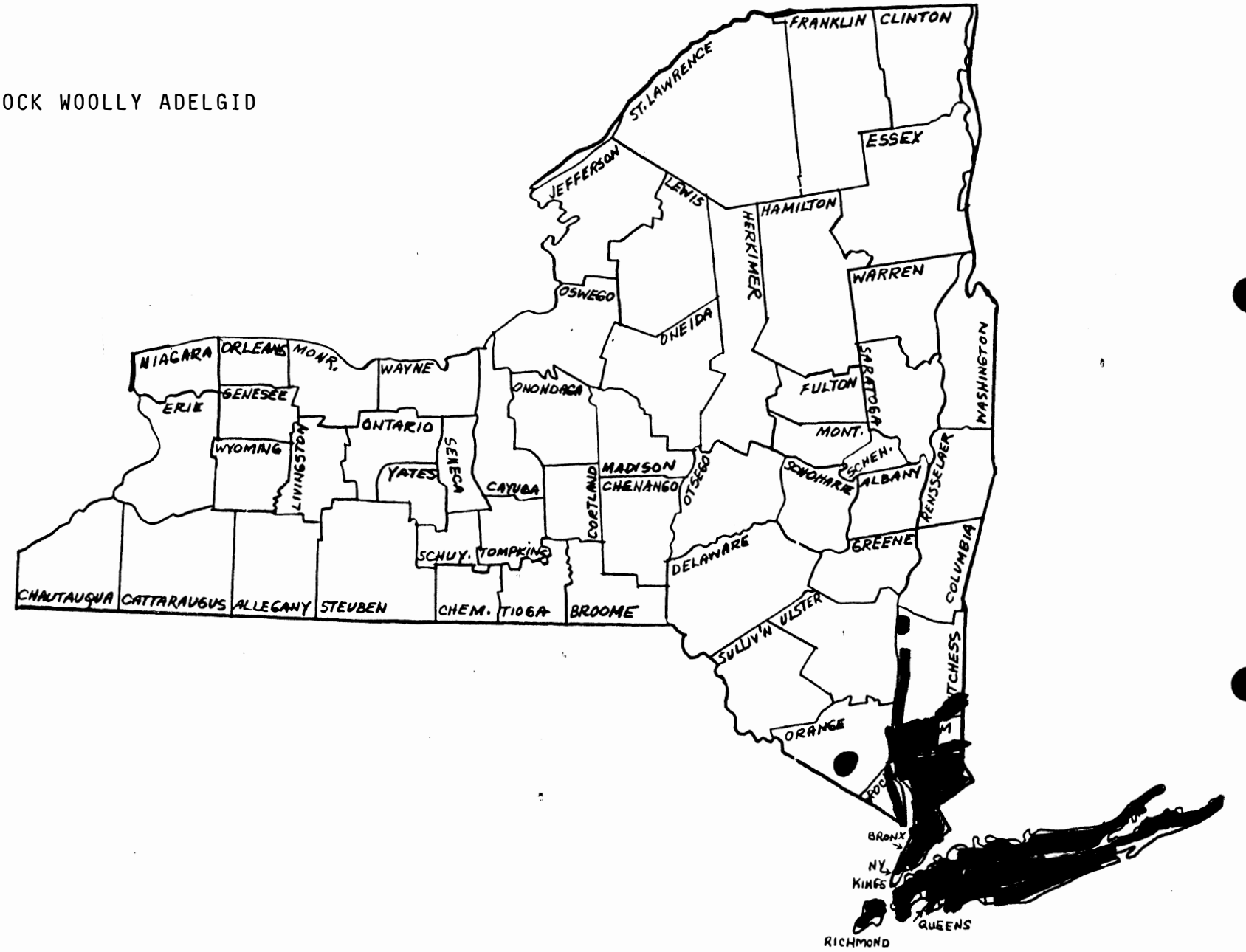
CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

Suffocants work very well to suppress adelgids on ornamental hemlocks

COMMENTS:

The adelgid is the single most important factor affecting the health of hemlock in New York. There is a rapid increase in the acreage infested each year. New infestations were discovered in the towns of Hyde Park, Red Hook, and Pawling in Dutchess County. New infestations also were found for the first time in the town of Warwick, Orange County.

HEMLOCK WOOLLY ADELGID



NEW YORK

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): [redacted]

(SPECIFIC NAME):

HOST:

rhodendron

PRESENT CONDITION:

AREA (TOTAL ACRES):

LOCATION: Harriman estate

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES):

severe mortality

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

unknown

TREND:

PAST TO PRESENT: high and stable

FUTURE: decline due to elimination of host

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

none

COMMENTS:

The insect clusters on the underside of the leaves of host plants. Leaves turn yellow and fall. Dieback occurs and whole plants are denuded and die. The insect has destroyed the host throughout the Harriman Estate property located in Orange County.

STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF CONSERVATION AND PRESERVATION
PACHAUG STATE NURSERY
SHELDON ROAD
VOLUNTOWN, CONNECTICUT 06384

NOV 13 1990

November 9, 1990

James P. Linnane
Forest Pest Management
U. S. Forest Service
P. O. Box 640
Durham, NH 03824

Dear Jim:

Hope this information is what you need. If you need further information please let me know.

I'll not take credit for this. I just got this in from the State's Entomologist's office, Dr. Magmarelli, last week.

I don't know what next year will bring.

Sincerely,

Pete Merrill
Forester II

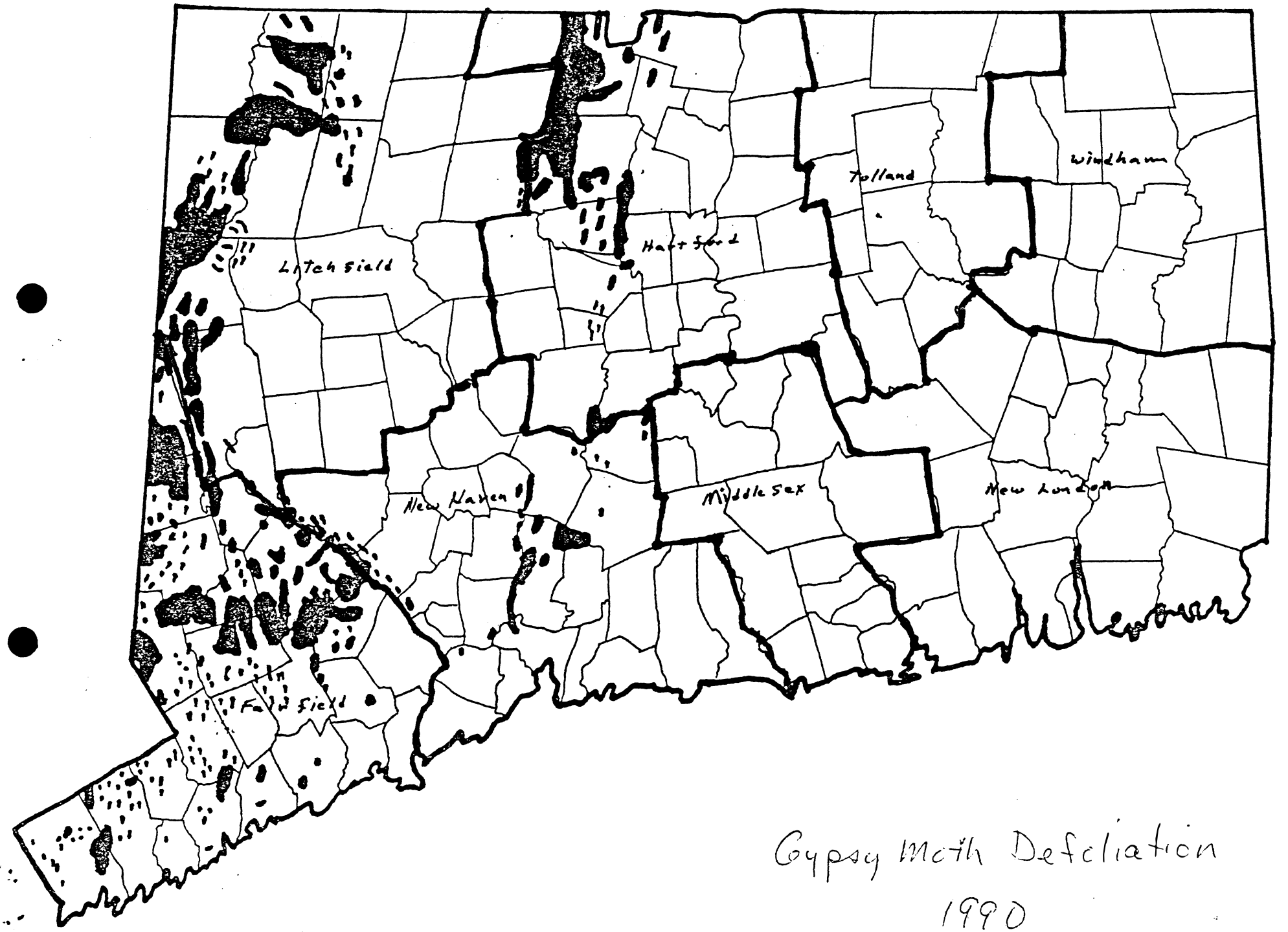
CGM:m

Enc/several

OCT 28 1990

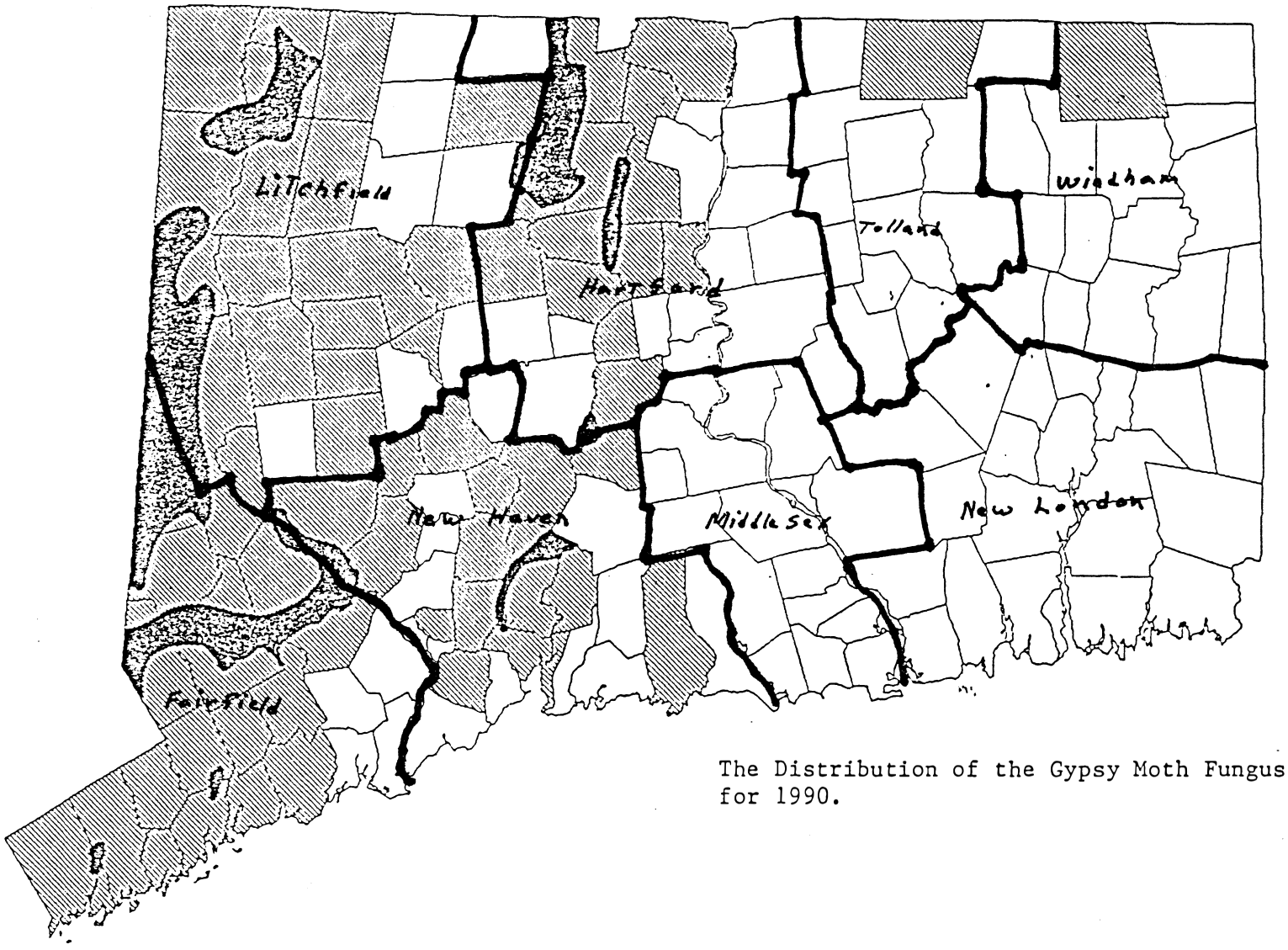
GYPSY MOTH DEFOLIATION 1990

COUNTY	10-25%	26-50%	51-75%	76-100%	TOTAL
FAIRFIELD	51,574	9,189	3,676	6,530	70,969
LITCHFIELD	50,320	5,319	1,368	2,307	59,314
HARTFORD	29,874	2,932	1,994	3,871	38,671
NEW HAVEN	7,075	312	235	0	7,622
	138,843	17,752	7,273	12,708	176,576



Gypsy Moth Defoliation

1990



The Distribution of the Gypsy Moth Fungus, Entomophaga maimaiga for 1990.

★ Every Idea Is A Link In The Chain of Progress ★JAN 24 1991

Send your Ideas to: *Employees' Suggestion Awards Program, 165 Capitol Ave., Hartford, 06115*

Interdepartment Message

STO-200 REV. 5-81 *(Stock No. 6938-050-01)*

SAVE TIME: *Handwritten messages are acceptable.*
Use carbon if you really need a copy. If typewritten, ignore faint lines.

	NAME	TITLE	DATE
To	Florence Paterson		1/14/91
	AGENCY USFS Post Mgt.	**ADDRESS**	
	NAME Pete Merrill	**TITLE**	**TELEPHONE**
From	**AGENCY** Ct. Div. Forestry	**ADDRESS**	

SUBJECT

Hemlock Looper - Ct.

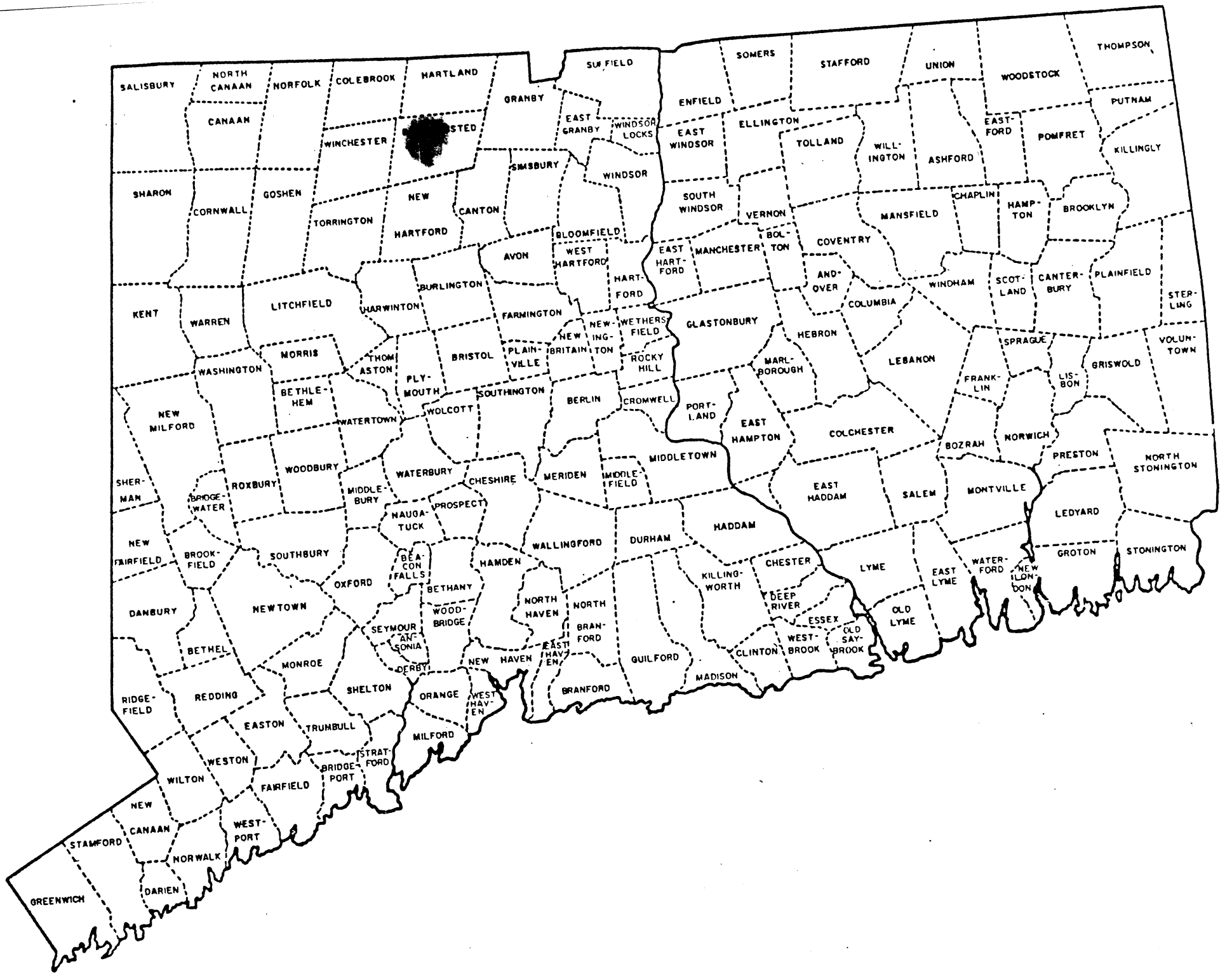
Sorry I did not Do this the Next Day. Here is a map of our known Hemlock Looper defoliation. There are probably 80-100 of Moderate to heavy defoliation and an unknown amount of Lighter defoliation.

I not sure it is Lambdina Fiscellaria as Maine describes the feeding from the inside out with defoliation of the outer parts of the Crown only in heavy outbreaks. From talking with our foresters That were involved the larva were still out in Sept. and they seemed to concentrate in the upper crown, sometimes giving the tree a stag-headed appearance. (May be athasaria ??)

Pete

★

SAVE TIME: *If convenient, handwrite reply to sender on this same sheet.*


SALISBURY
NORTH CANAAN
NORFOLK
COLEBROOK
HARTLAND
SUFFIELD
GRANBY
SOMERS
STAFFORD
UNION
WOODSTOCK
THOMPSON
CANAAN
WINCHESTER
EAST GRANBY
WINDSOR LOCKS
ENFIELD
EAST WINDSOR
ELLINGTON
TOLLAND
WILLINGTON
ASHFORD
EASTFORD
POMFRET
PUTNAM
KILLINGLY
SHARON
CORNWALL
GOSHEN
TORRINGTON
NEW HARTFORD
CANTON
SIMSBURY
WINDSOR
SOUTH WINDSOR
VERNON
MANSFIELD
CHAPLIN
HAMPTON
BROOKLYN
BLOOMFIELD
AVON
WEST HARTFORD
EAST HARTFORD
MANCHESTER
BOLTON
COVENTRY
ANDOVER
KENT
WARREN
LITCHFIELD
HARWINTON
BURLINGTON
FARMINGTON
HARTFORD
WINDHAM
SCOTLAND
CANTERBURY
PLAINFIELD
STERLING
NEW-INGTON
WETHERSFIELD
GLASTONBURY
COLUMBIA
HEBRON
SPRAGUE
VOLUNTOWN
WASHINGTON
MORRIS
THOMASTON
BRISTOL
PLAINVILLE
NEW BRITAIN
ROCKY HILL
MARLBOROUGH
LEBANON
FRANKLIN
LISBON
GRISWOLD
BETHLEHEM
PLYMOUTH
SOUTHINGTON
BERLIN
CROMWELL
PORTLAND
EAST HAMPTON
COLCHESTER
NEW MILFORD
WATERTOWN
WOLCOTT
BOZRAH
NORWICH
PRESTON
NORTH STONINGTON
WOODBURY
WATERBURY
CHESHIRE
MERIDEN
MIDDLEFIELD
MIDDLETOWN
SHERMAN
ROXBURY
BRIDGEWATER
MIDDLEBURY
NAUGATUCK
PROSPECT
EAST HADDAM
SALEM
MONTVILLE
LEDYARD
NEW FAIRFIELD
BROOKFIELD
SOUTHBURY
BEACON FALLS
WALLINGFORD
DURHAM
HADDAM
GROTON
STONINGTON
OXFORD
BETHANY
HAMDEN
CHESTER
LYME
EAST LYME
WATERFORD
NEW LONDON
DANBURY
NEWTOWN
WOODBRIDGE
NORTH HAVEN
NORTH BRANFORD
KILLINGWORTH
DEEP RIVER
ESSEX
OLD LYME
SEYMOUR
ANSONIA
BETHEL
MONROE
DERBY
NEW HAVEN
EAST HAVEN
GUILFORD
CLINTON
WESTBROOK
OLD SAYBROOK
SHELTON
ORANGE
WEST HAVEN
BRANFORD
MADISON
RIDGEFIELD
REDDING
EASTON
TRUMBULL
MILFORD
WESTON
STRATFORD
BRIDGEPORT
WILTON
FAIRFIELD
NEW CANAAN
WESTPORT
STAMFORD
NORWALK
DARIEN
GREENWICH

1990 PEST CONDITIONS REPORT WORK SHEET

RHODE ISLAND

RI

PEST - (COMMON NAME): Pear thrips

(SPECIFIC NAME): Taeniothrips inconsequens

HOST: Apparently incomplete. Sugar maple, Red maple, various orchard fruits, grape and blackberry vines are known hosts.

PRESENT CONDITION:

AREA - TOTAL ACRES: Approximately 50 acres.

LOCATION: 1 plot at East Farm and 3 plots at Greene, at West Greenwich and Charlie Chase Farm.

SEVERITY - INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES:

LOSSES - INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES:

TREND - CHANGES IN INCIDENCE AND SEVERITY OVER THE PAST FEW YEARS AND EXPECTATIONS FOR NEXT YEAR: Apparently infestation is growing and expected to expand in forest maples and northern apple orchards.

CONTROL PROJECTS - METHOD, MATERIAL, ACRES, COST, RESULTS:

ADDITIONAL COMMENTS: Division plans to expand survey for adults. Soil sampling not done by the Division but cooperative extension service did some sampling in Washington and Kent counties.

1990 PEST CONDITIONS REPORT WORK SHEET

PEST - (COMMON NAME): Oak and Maple Anthracnose

(SPECIFIC NAME): Gnomonia

HOST: Various species of Oak and Maple trees.

PRESENT CONDITION:

AREA - TOTAL ACRES: not surveyed

LOCATION: Statewide

SEVERITY - INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES: Moderate infections statewide.

LOSSES - INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES: No estimates done.

TREND - CHANGES IN INCIDENCE AND SEVERITY OVER THE PAST FEW YEARS AND EXPECTATIONS FOR NEXT YEAR: Second year of increasing problems.

CONTROL PROJECTS - METHOD, MATERIAL, ACRES, COST, RESULTS:
No controls done.

ADDITIONAL COMMENTS:

1990 PEST CONDITIONS REPORT WORK SHEET

RHODE ISLAND

PEST - (COMMON NAME): Orange-striped Oakworm

(SPECIFIC NAME): Anisota senatoria

HOST: White and other oak species.

PRESENT CONDITION:

AREA - TOTAL ACRES: 100 acres.

LOCATION: Scituate. Block of upland hardwood, west side of Route 116, between Route 14 and Route 12.

SEVERITY - INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES: Moderate

LOSSES - INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES:

TREND - CHANGES IN INCIDENCE AND SEVERITY OVER THE PAST FEW YEARS AND EXPECTATIONS FOR NEXT YEAR: Before 1990 - heavy for several years. Population may be declining.

CONTROL PROJECTS - METHOD, MATERIAL, ACRES, COST, RESULTS:
None. Salvage methods like stiring soil, etc.

ADDITIONAL COMMENTS:

1990 PEST CONDITIONS REPORT WORK SHEET

RHODE ISLAND

PEST - (COMMON NAME): Scolytid Beetle

(SPECIFIC NAME): Pityphthonus

HOST: White pine

PRESENT CONDITION:

AREA - TOTAL ACRES: approximately 2,700 acres

LOCATION: Glocester and Burriville

SEVERITY - INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES: Moderate. Some mortality in sapling trees and seedlings.

LOSSES - INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES: None

TREND - CHANGES IN INCIDENCE AND SEVERITY OVER THE PAST FEW YEARS AND EXPECTATIONS FOR NEXT YEAR: Traces before 1990. There has been an increase in management areas and outside areas during forest health monitoring (Gloucester). Increasing in the future.

CONTROL PROJECTS - METHOD, MATERIAL, ACRES, COST, RESULTS:

None

ADDITIONAL COMMENTS:

1990 PEST CONDITIONS REPORT WORK SHEET

RHODE ISLAND

PEST - (COMMON NAME): Red Pine Scale

(SPECIFIC NAME): Matsucoccus resinosae

HOST: Red pine

PRESENT CONDITION:

AREA - TOTAL ACRES: campground area - 120 acres

LOCATION: Charlestown

SEVERITY - INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES: Heavy, extreme liability. Heavy defoliation.

LOSSES - INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES: No cost estimates done.

TREND - CHANGES IN INCIDENCE AND SEVERITY OVER THE PAST FEW YEARS AND EXPECTATIONS FOR NEXT YEAR: Increasing every year. Will probably continue to be severe.

CONTROL PROJECTS - METHOD, MATERIAL, ACRES, COST, RESULTS: Remove dead trees.

ADDITIONAL COMMENTS:

1990 PEST CONDITIONS REPORT WORK SHEET

RHODE ISLAND

PEST - (COMMON NAME): Hemlock Wooly Adelgid

(SPECIFIC NAME): Adelges tsugae

HOST: Eastern hemlock (Tsuga caradensis)

PRESENT CONDITION:

AREA - TOTAL ACRES: Five properties infested last year. Three of them have been exterminated. New infestation of 11 - 12 city blocks found in Westerly.

LOCATION: Kent and Washington counties

SEVERITY - INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES: Infestations are very apparent on the infested properties.

LOSSES - INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES: No estimates done.

TREND - CHANGES IN INCIDENCE AND SEVERITY OVER THE PAST FEW YEARS AND EXPECTATIONS FOR NEXT YEAR: Third year of infestation. Future - spread will be likely if infestations are not controlled.

CONTROL PROJECTS - METHOD, MATERIAL, ACRES, COST, RESULTS:

ADDITIONAL COMMENTS: Three of the original five infestations under control but large infestation in the southwest corner of the state is a big problem.

1990 PEST CONDITIONS REPORT WORK SHEET

RHODE ISLAND

PEST - (COMMON NAME): Dogwood Anthracnose

(SPECIFIC NAME): Discula sp.

HOST: Dogwood trees

PRESENT CONDITION:

AREA - TOTAL ACRES: not surveyed

LOCATION: Statewide

SEVERITY - INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES: Light to medium.

LOSSES - INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES: No estimates done.

TREND - CHANGES IN INCIDENCE AND SEVERITY OVER THE PAST FEW YEARS AND EXPECTATIONS FOR NEXT YEAR: Light damage during 1989. Moderate damage this year. Future - more problems expected.

CONTROL PROJECTS - METHOD, MATERIAL, ACRES, COST, RESULTS: No control work done.

ADDITIONAL COMMENTS: Rainy growing season may have caused suseptible trees to grow more vigorously and become more resistant to latent infections.

RHODE ISLAND

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Gypsy moth

(SPECIFIC NAME): Lymantria Dispar

HOST: Oaks

PRESENT CONDITION: No noticeable infestation

AREA (TOTAL ACRES):

LOCATION:

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES):

none

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

none

TREND:

PAST TO PRESENT: continued low level populations statewide

FUTURE: no infestation expected for spring 1991

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

none

COMMENTS:

VT
INCLUDING GMNF

AGENCY OF NATURAL RESOURCES

DEPARTMENT OF FORESTS, PARKS AND RECREATION

STATE OF VERMONT

FOREST INSECT AND DISEASE CONDITIONS
NORTHERN REGION

CALENDAR YEAR 1990

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30 November 1990

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INTRODUCTION

The information in this report is based largely on aerial surveys to detect defoliation, dieback, and mortality, as well as ground surveys and observations of forest resource protection personnel and other forestry and department staff.

Aerial surveys were flown in late June to mid-July to detect pear thrips damage and mid-July to early September to detect gypsy moth defoliation and anthracnose.

WEATHER SUMMARY

The 1990 growing season can be described in one word.....wet. Precipitation through the period 1 May - 30 September was 35 percent above normal in north-central Vermont (Table 1) and the rest of the region had similar above-normal precipitation. There were two very damaging thunderstorms in July that dropped four to five inches of rain in some locations and washed out many roads. Despite this, seasonal precipitation was very evenly spread throughout the spring and summer months. Only on a couple of occasions did one of our observers in north-central Vermont record no precipitation during any seven-day period, and there were no extended periods of dry weather this season anywhere in the region. Temperatures were near normal through the season, with April being slightly colder than normal and August slightly warmer than normal. Both 1989 and 1990 were very wet, and ground water conditions are well above normal in most locations now.

Table 1. North-Central Vermont Precipitation During the 1990 Growing Season*

MONTH	AVERAGE PRECIPITATION	DEPARTURE FROM NORMAL
May	4.42"	+1.20"
June	3.38"	+ .11"
July	3.87"	+ .21"
August	8.34"	+4.97"
September	2.52"	- .68"

*Vermont Division of Forestry Stations in Wolcott, Barre, Randolph, Fairlee, Worcester

Gypsy Moth, Lymantria dispar (Figure 1), populations continued to expand, with 13,769 acres defoliated compared to 5,940 acres in 1989 (Table 3). This is considered an underestimate of true area defoliated in 1990 because of less than optimum weather conditions and timing during the annual aerial surveys conducted to detect this insect. Addison County with 11,773 acres defoliated had the most damage (Table 3, Figure 2). An additional 11,237 acres were protected by an aerial application of biological insecticide.

Table 3. Mapped Acres of 1990 Gypsy Moth Defoliation

County	Damage Level*			Total Acres
	Light	Moderate	Heavy	
Addison	514	6,191	5,068	11,773
Chittenden	453	868	398	1,719
Franklin		26	51	77
Orange		100	100	200
Total	967	7,185	5,612	13,769

*Light = less than 30% defoliation
Moderate = 30-60%
Heavy = greater than 60%

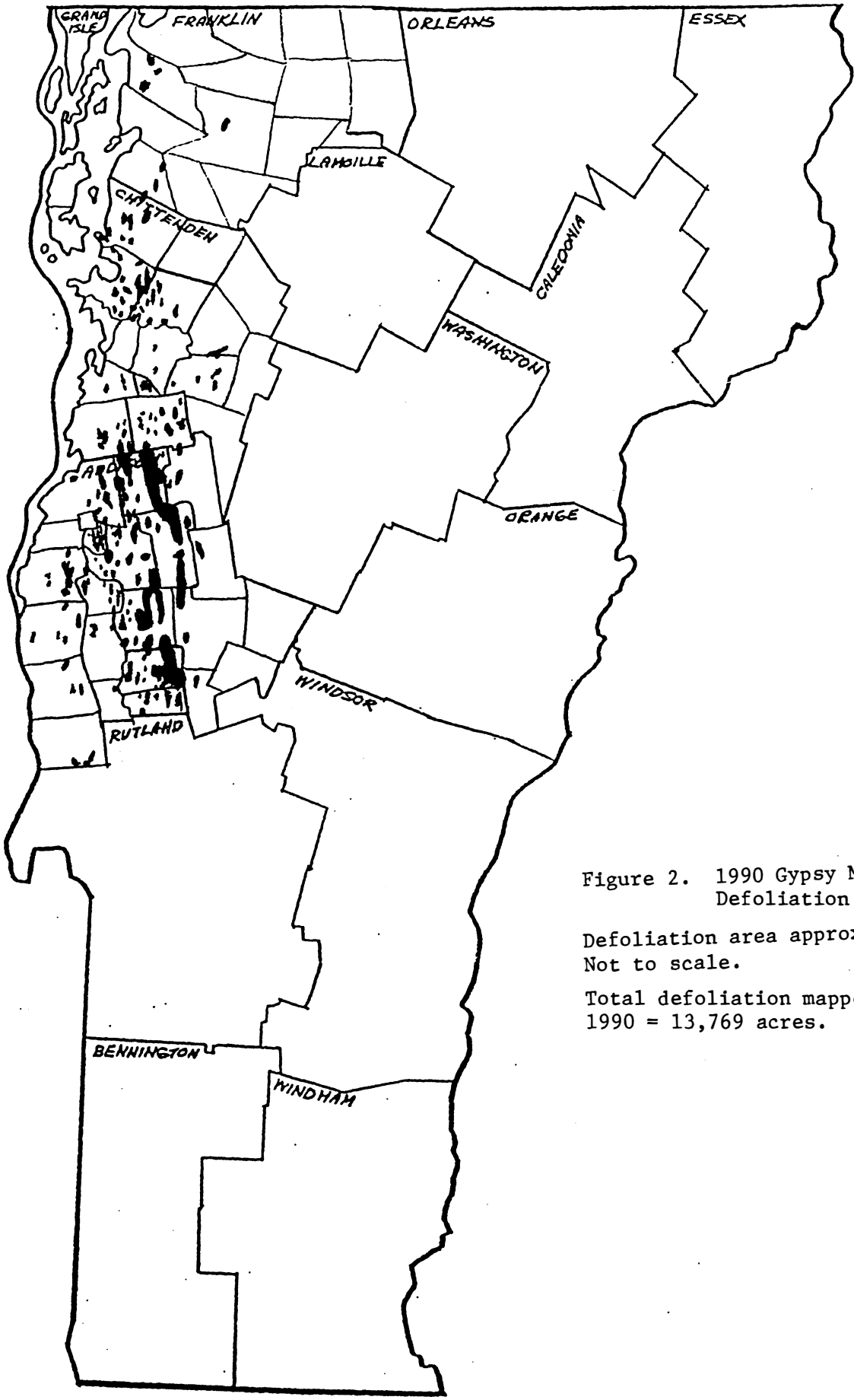

Figure 2. 1990 Gypsy Moth Defoliation

Defoliation area approximate. Not to scale.

Total defoliation mapped in 1990 = 13,769 acres.

Gypsy moth populations were affected by the fungus Entomophaga maimaiga again this year for the second consecutive year. This fungus was introduced to the Boston area from Japan in 1910-1911 and began acting as a natural control last year in northeastern areas with above normal precipitation. With an even greater increase in precipitation this year, the fungus was even more widespread, with confirmation of its occurrence further north in the state (Milton) than in 1989. There was also an abundance of virus-killed gypsy moth larvae in many locations this year, making it difficult to determine which was the most prevalent mortality factor. Gypsy moth populations for 1991 are generally lower than in 1989 but are increasing in some northern locations, as reflected by the focal area monitoring data (Table 4).

Table 4. Gypsy Moth Egg Mass Counts From Focal Area Monitoring plots: 1986-1990

Plot Location	Number of Egg Masses* 1986	1987	1988	1989	1990
Arrowhead**	5	21	48	96	3
Brigham Hill***	10	37	28	74	212
Middlesex	0	0	1	19	23
Sandbar	-	45	173	129	57
Average	5	26	63	80	74

*Average per plot for two, 15m diameter (.045AC) burlap-banded plots.
**Aerial sprayed with B.t. (Foray) in 1990.
***Aerial sprayed with B.t. (SAN415) in 1988.

A cooperative gypsy moth suppression project was conducted in late May to protect foliage on 7,734 acres in Chittenden County and 3,503 acres in Addison County, for a total of 11,237 acres. This was a cooperative effort between our department, the Vermont Department of Agriculture, and the U.S. Forest Service. The latter agency also provided 50 percent cost reimbursement. Most of the acreage in Addison County (3,202AC) was at the request of the Green Mountain National Forest and most of the acreage in Chittenden County (7,514AC) was at the request of the following municipalities: Burlington, South Burlington, Colchester, Essex (town and village), and Winooski.

All spray blocks were treated once with Foray 48B (Bacillus thuringiensis var. kurstaki), applied by small, twin-engine, fixed-wing aircraft at the rate of 24 Billion International Units (64 oz.) per acre (Figure 3). Larvae were at optimum development size (46% instar 1; 51% instar 2; 3% instar 3) for the Foray to be effective, but noticeable defoliation (average of 9%) had already taken place prior to treatment. Foliage expansion at time of treatment averaged about 80 percent. Weather conditions on the days of spraying were excellent and no rain was received for at least 30 hours after treatment.

To evaluate defoliation, 10 to 30 oak trees per block were rated from the ground for 26 of the Chittenden County blocks. This was done on the day of treatment to estimate presepray defoliation, and again in mid-July to estimate final defoliation. This was compared to data from 30 trees per block for five unsprayed blocks in the same general area. Prespray (1989) egg mass counts taken in the fall of 1989 to determine spray blocks were based on a combination of five minute walk, egg mass counts and one-fortieth acre plots while postspray (1990) counts were based on 194 fixed-area plots, mostly one-fortieth acre in size, distributed among 62 spray blocks and six untreated check blocks.

Some moderate to heavy defoliation (about 3% of the area) took place in some spray blocks, but overall, the project was very successful. Defoliation in the town project spray blocks averaged 12 percent compared to 52 percent in the unsprayed areas (Figure 4). Some oaks suffered considerable defoliation by first and second instar larvae just prior to treatment (Figure 5). Defoliation on the days of spraying averaged nine percent. Thus, on average, only three percent additional defoliation took place after treatment. Postspray egg mass counts averaged 299 per acre for Chittenden County spray blocks compared to prespray counts of 5,136 per acre (Figure 6). Untreated areas (5-Chittenden County/1-Addison County) averaged 2,761 postspray (1990) egg masses per acre compared to 4,057 prespray (1989) egg masses per acre. Addison County spray blocks, excluding the Green Mountain National Forest, averaged 155 postspray egg masses per acre compared to 2,418 prespray egg masses per acre. Only three spray blocks, totaling 212 acres, have high enough egg mass counts (more than 1,000 per acre) to potentially result in moderate to heavy defoliation in 1991.

Several areas in the Connecticut River Valley in Orange County that had high egg mass counts in the fall of 1989 apparently suffered winter mortality of egg masses above snowline, and 1990 defoliation was only light. Many surviving larvae were infected by fungus and virus. Addison and Chittenden Counties are expected to experience some defoliation in 1991, but it is likely to be much less widespread and less severe than in 1990.

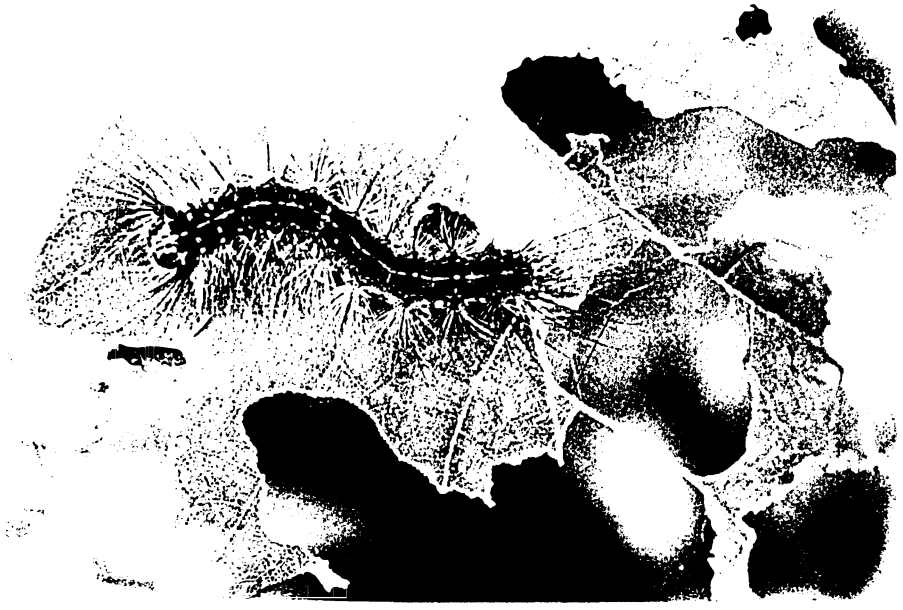

Figure 1. Gypsy moth larva (fifth instar).

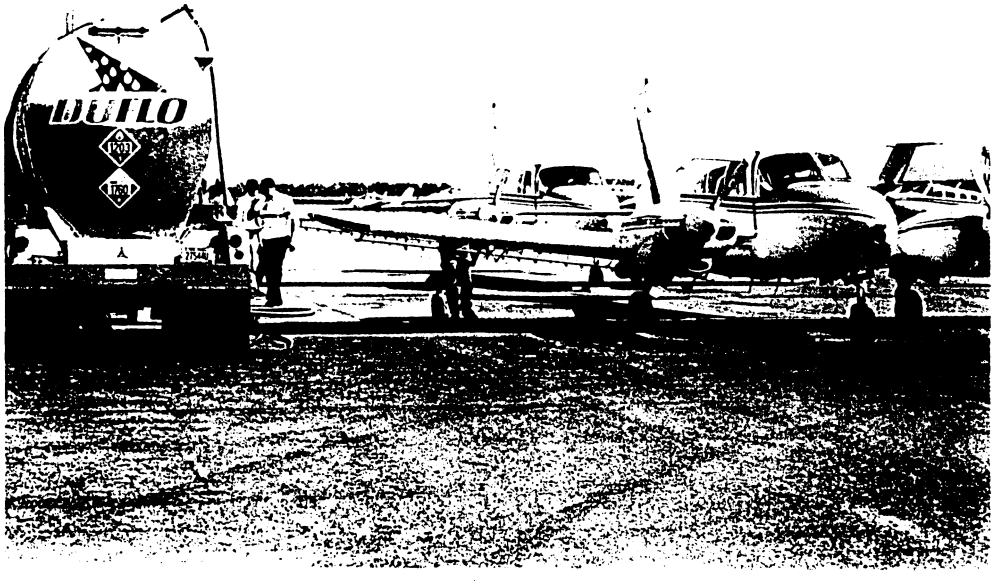

Figure 3. Two aztec spray planes operated by Duflo Spray Chemical, Inc. getting ready for gypsy moth spray operations, Burlington International Airport, 27 May 1990.

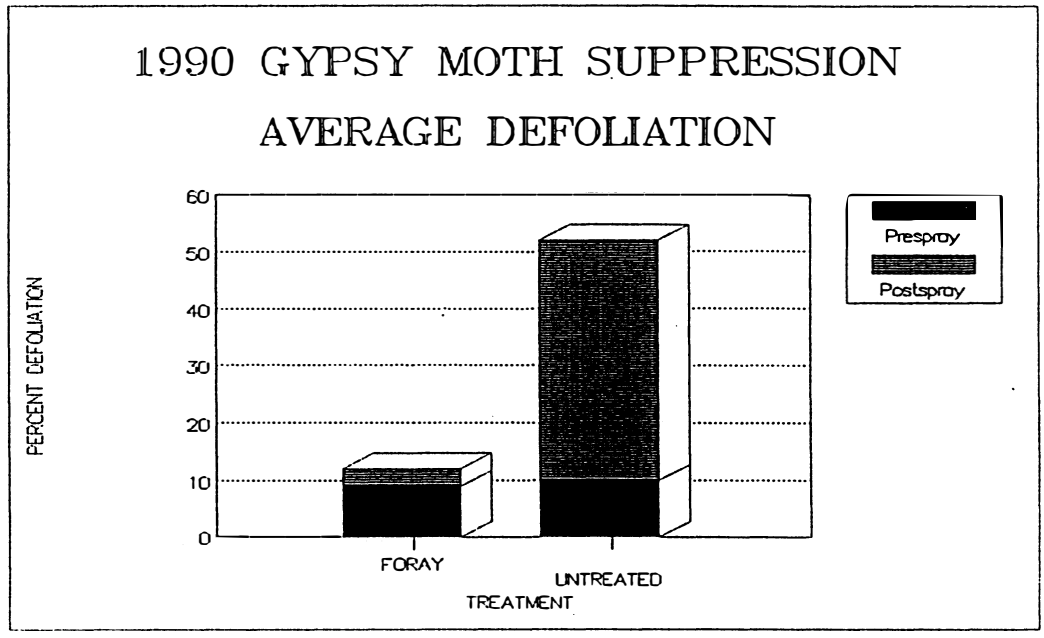

Figure 4. Average gypsy moth defoliation in 25 Chittenden County blocks treated with Foray in 1990 compared to 5 untreated blocks.

Figure 5. Heavy defoliation of young oak leaves by first and second instar gypsy moth larvae.

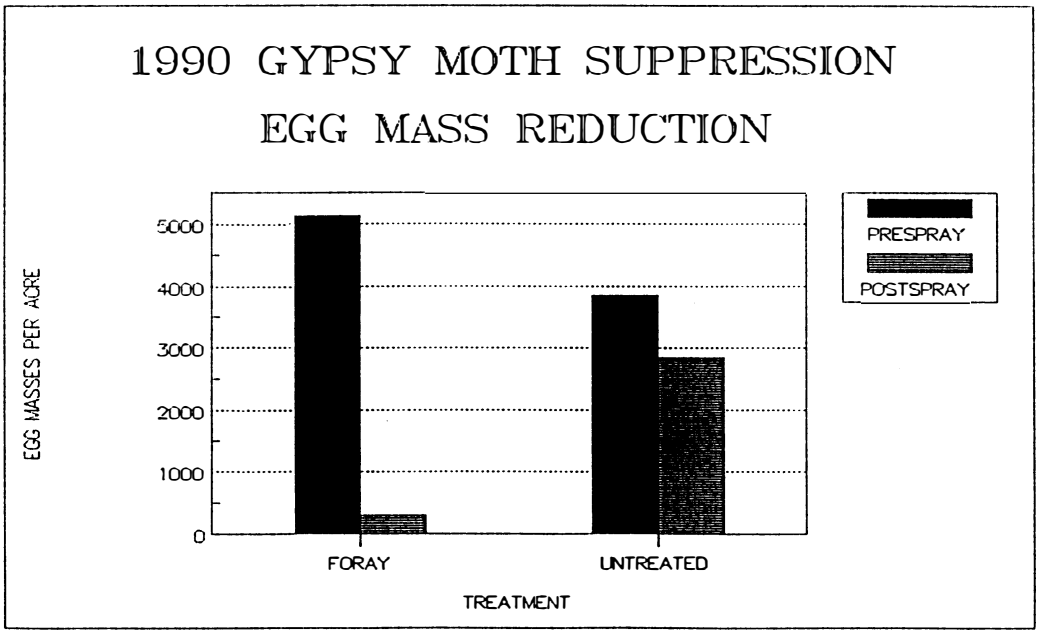

Figure 6. Average gypsy moth prespray (1989) and post-spray (1990) egg mass counts in 39 Chittenden County blocks treated with Foray in 1990 compared to 5 untreated blocks.

Maple Leaf Cutter, Paraclemensia acerifoliella, populations increased substantially throughout the region, with widespread light to moderate defoliation evident by early September, plus scattered areas of heavy defoliation. Heavy damage was mostly confined to lower and inner (next to trunk) crowns of sugar maple making aerial detection extremely difficult. This defoliation pattern is typical of other years when rainy periods coincided with adult emergence, probably resulting in a confinement of egg laying to the more protected areas of the crown. Areas of heavy defoliation detected from the air included 131 acres in Caledonia County, 62 acres in Essex County, and 274 acres in Orleans County, for a total of 467 acres (Table 5, Figure 7). An additional 135 acres of heavy defoliation were detected in Franklin County (Richford) by a ground visit. This insect is likely to cause more heavy defoliation in 1991.

Saddled Prominent, Heterocampa guttivata, is still present in Orange County, but very little defoliation occurred this year. Pupae could be found in several locations in the county this fall so this insect has the potential to increase in 1991. Elsewhere in the region few larvae were observed.

Table 5. 1990 Mapped Acres of Heavy Maple Leaf Cutter Defoliation*

County	Acres
Caledonia	131
Essex	62
Orleans	274
Total	467

*Heavy = more than 60% defoliation.

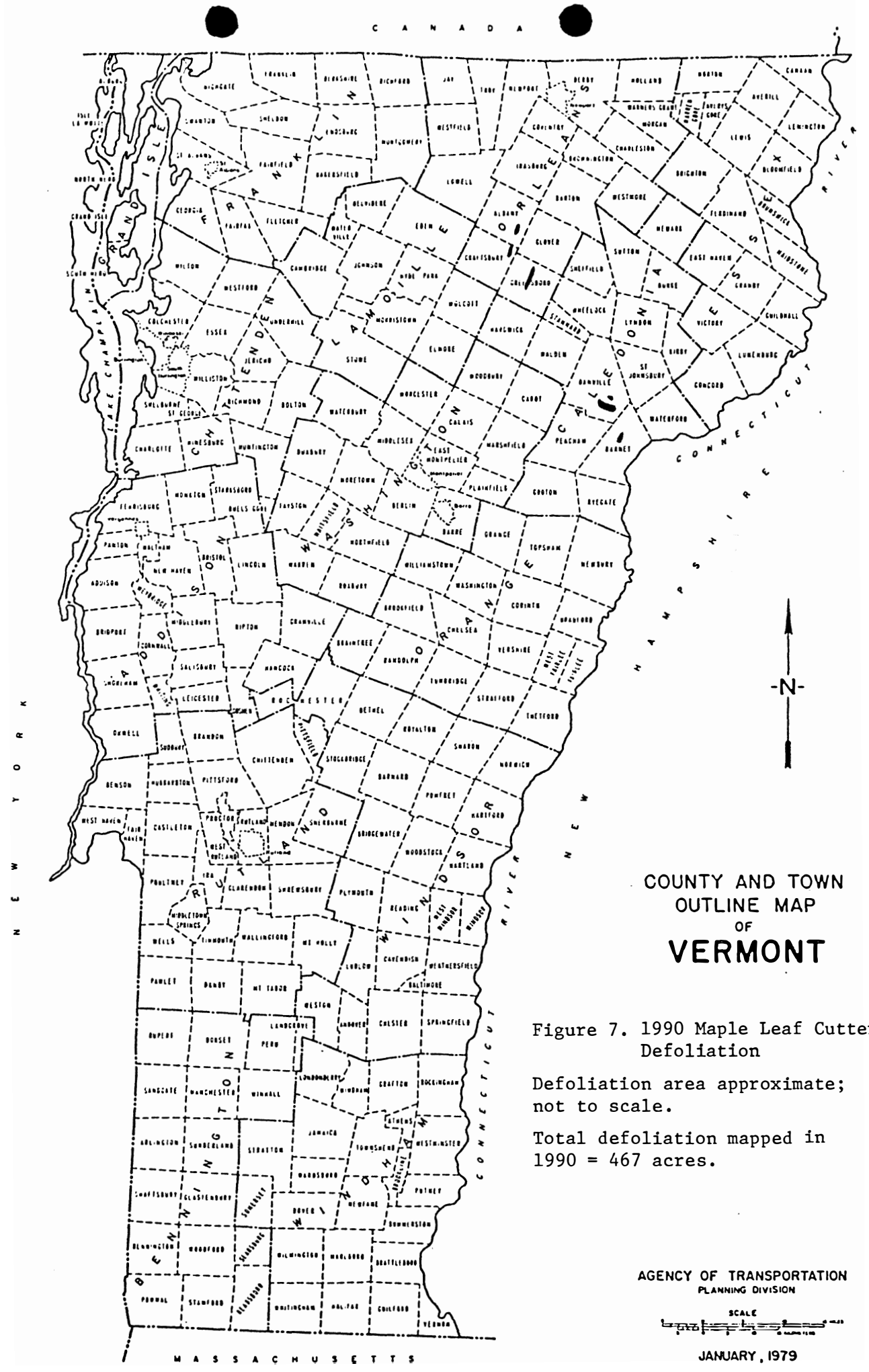

Figure 7. 1990 Maple Leaf Cutter Defoliation

Defoliation area approximate; not to scale.

Total defoliation mapped in 1990 = 467 acres.

OTHER HARDWOOD DEFOLIATORS

INSECT	HOST(S)	LOCALITY	REMARKS
American Aspen Beetle *Gonioctena americana*			N.O.*
American Dagger Moth *Acronicta americana*			N.O.
Birch Leaf Folder *Ancylis discigerana*	Yellow Birch	Hyde Park	Trace damage only
Birch Leaf Miner *Fenusa pusilla*	Paper Birch Gray Birch Yellow Birch	Widespread 210 acres aerially mapped in Franklin & Chittenden Counties	Unusually little defoliation from first generation probably due to wet weather during egg laying; some moderate to heavy defoliation from second generation feeding
Birch Skeletonizer *Bucculatrix canadensisella*	White Birch Yellow Birch		N.O.
Bruce Spanworm *Operophtera bruceata*	Sugar Maple	Stowe Bristol Peacham	A few moths observed in November
Cecropia Moth *Hyalophora cecropia*	Crab Apple	Morristown	Unusually heavy infestation on ornamental, but only light defoliation
Cherry Scallop Shell Moth *Hydria prunivorata*			N.O.

*N.O. = not observed

OTHER HARDWOOD DEFOLIATORS

INSECT	HOST(S)	LOCALITY	REMARKS
Dogwood Sawfly *Macremphytus tarsatus*	Silky Dogwood	Bristol Middlebury	Light defoliation of ornamentals
Early Birch Leaf Edgeminer *Messa nana*	Birch sp.		N.O.
Eastern Tent Caterpillar *Malacosoma americanum*	Cherry Apple	Widespread	Common but decreased from 1989 levels
Elm Leaf Beetle *Pyrrhalta luteola*	American Elm	Scattered	Very light defoliation
Elm Leaf Miner *Fenusa ulmi*	Elm		N.O.
Fall Cankerworm *Alsophila pometaria*			N.O.
Fall Webworm *Hyphantrea cunea*	Hardwoods	Widespread except Northeast Kingdom	Much more noticeable than during the past few years
Forest Tent Caterpillar *Malacosoma disstria*			See narrative
Green Striped Mapleworm *Anisota rubicunda*	Maples		N.O.
Gypsy Moth *Lymantria dispar*			See narrative

OTHER HARDWOOD DEFOLIATORS

INSECT	HOST(S)	LOCALITY	REMARKS
Half Winged Geometer *Phigalia titea*	Red Oak Sugar Maple		N.O.
Japanese Beetle *Popillia japonica*	Ornamentals	Widespread	Light but increasing compared to 1989
Large Aspen Tortrix *Choristoneura conflictana*			N.O.
Linden Looper *Erranis tiliaria*			N.O.
Locust Leaf Miner *Odontata dorsalis*	Black Locust	Chittenden Washington Counties	Some moderate to heavy defoliation
Maple Leaf Cutter *Paraclemensia acerifoliella*			See narrative
Maple Leafblotch Miner *Cameraria aceriella*		Chittenden Franklin	Common throughout; light damage; first year that this miner has been very noticeable
Maple Trumpet Skeletonizer *Epinotia aceriella*	Sugar Maple Red Maple	Widespread	Unusually common this year, occasionally causing moderate defoliation of sugar maples
Maple Webworm *Tetralopha asperatella*	Sugar Maple	Widespread	Common this year for the first time in several years; light defoliation
Mountain Ash Sawfly *Pristiphora geniculata*	Mountain Ash	Caledonia County	Decreased this year; detected in only one area

OTHER HARDWOOD DEFOLIATORS

INSECT	HOST(S)	LOCALITY	REMARKS
Oak Leafroller *Archips semiferanus*			N.O.
Oak Leaf Tier *Croesia semipurpurana*	Red Oak	Essex	One of three pheromone traps on Brigham Hill caught 1 moth, but all three traps in Milton (Sandbar) were negative
Oak Skeletonizer *Bucculatrix ainsliella*	Oak		N.O.
Orange-humped Mapleworm *Symmerista leucitys*	Sugar Maple		N.O.
Pear Sawfly *Caliroa cerasi*	Hawthorne	Danville	Remains present
Pin Oak Sawfly *Caliroa sp.*			N.O.
Red-humped Oakworm *Symmerista canicosta*	Red Oak		N.O.
Rose Chafer *Macrodactylus subspinosus*	Hardwood Ornamentals	St.Johnsbury	Decreasing but noticeable
Saddled Prominent *Heterocampa guttivata*			See narrative
Satin Moth *Leucoma salicis*	Balsam Poplar Cottonwood	Orange Lamoille Counties	Scattered light defoliation in Lamoille County; heavy defoliation in Randolph; less common than in 1989

OTHER HARDWOOD DEFOLIATORS

INSECT	HOST(S)	LOCALITY	REMARKS
Solitary Leaf Roller *Sparganothis pettitana*	Sugar Maple	Lamoille County	Scattered, light
Solitary Oak Leaf Miner *Cameraria hamadryadella*			N.O.
Spiny Elm Caterpillar *Nymphalis antiopa*			N.O.
Spring Cankerworm *Paleacrita vernata*			N.O.
Uglynest Caterpillar *Archips cerasivoranus*	Cherry	Widely scattered	Occasionally observed

SOFTWOOD DEFOLIATORS

Spruce Budworm, Choristoneura fumiferana, continued at extremely low levels in 1990, with no visible defoliation and no larvae detected. Only one budworm moth was caught by use of pheromone traps again this year.

Pheromone traps have been used in the state ever since 1983, the last year of heavy budworm defoliation, and moth catch reflects the dramatic drop in population levels since then (Figure 8). For the past three years, 20 sites have received three Multi-pher traps per site (Table 6). Only one trap from a different location (Figure 9) each year (Sutton-88; Newbury-89; Wheelock-90) has caught any moths, indicating that moth catch is probably a random event and there are no apparent "hot spots" or "focal areas" for spruce budworm. All traps were baited with "Biolures" this year and this is expected to be the standard lure from now on.

Table 6. Average Number of Spruce Budworm Moths Caught Per Trap in Pheromone Traps, 1987-1990*.

Lure	1987	1988	1989	1990
PVC	0.01	0.05	0.00	--
Biolure	--	--	0.03	0.02
Number of Sites	19	20	10 per lure	20

*Multi-pher traps: 3 per site in 1990, 1989, and 1988; 3-5 per site in 1987.

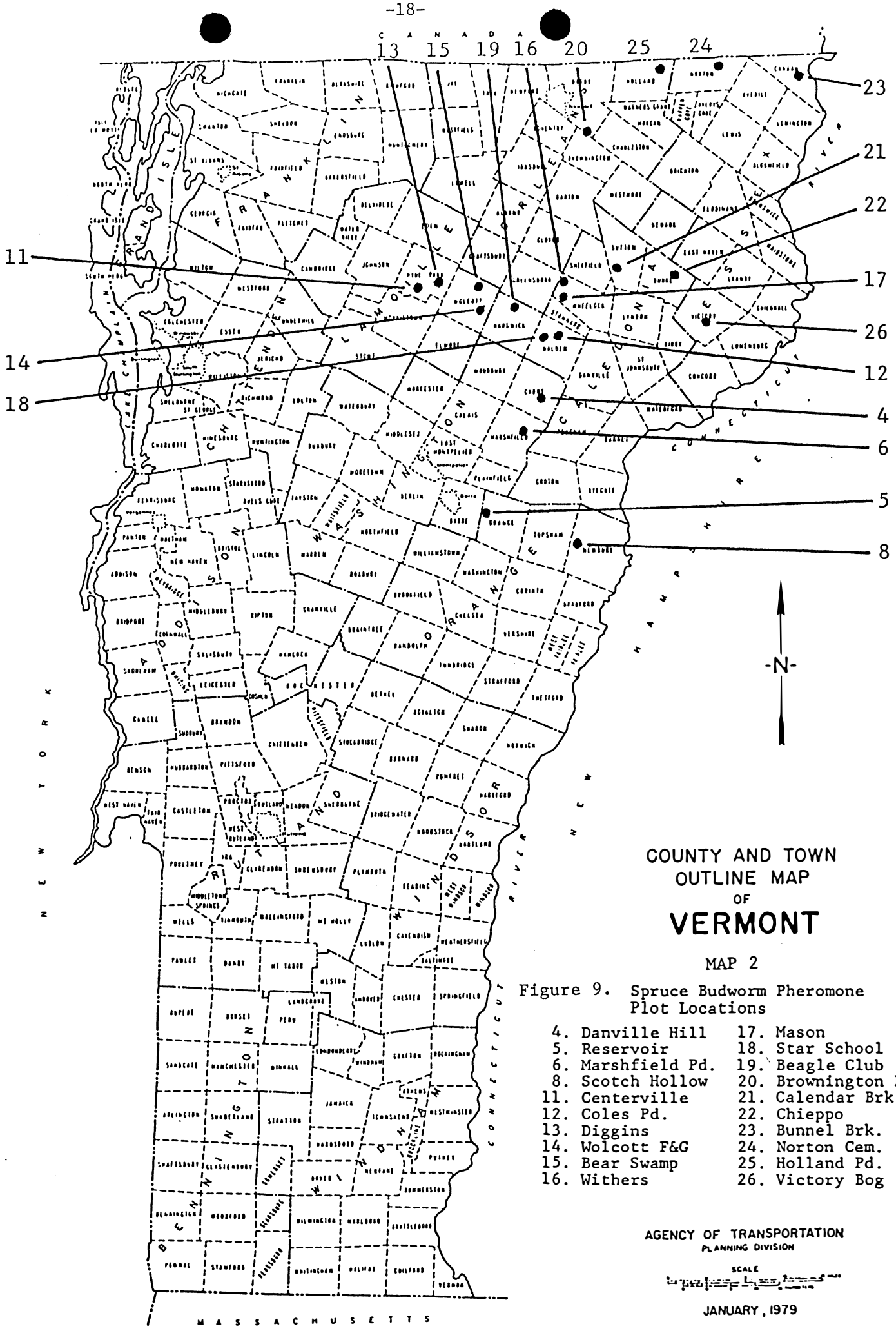

Figure 9. Spruce Budworm Pheromone Plot Locations

4. Danville Hill
5. Reservoir
6. Marshfield Pd.
8. Scotch Hollow
11. Centerville
12. Coles Pd.
13. Diggins
14. Wolcott F&G
15. Bear Swamp
16. Withers
17. Mason
18. Star School
19. Beagle Club
20. Brownington Pd
21. Calendar Brk.
22. Chieppo
23. Bunnel Brk.
24. Norton Cem.
25. Holland Pd.
26. Victory Bog

OTHER SOFTWOOD DEFOLIATORS

INSECT	HOST(S)	LOCALITY	REMARKS
Arborvitae Leaf Miner *Argyresthia thuiella*	Arborvitae	Widespread	Ornamentals-increasing with abundant light defoliation and some moderate defoliation
Balsam Fir Sawfly *Neodiprion abietis*	Balsam Fir Blue Spruce	Windsor Washington Lamoille Orange Counties	Common in 1989 for the first time but not observed in 1990
Green Hemlock Needleminer *Coleotechnites apicitripunctella*	Hemlock		N.O.
Hemlock Looper *Lambdina fiscellaria*	Hemlock		N.O.
Introduced Pine Sawfly *Diprion similis*	White Pine Scots Pine		N.O.
Larch Casebearer *Coleophora laricella*	European Larch Japanese Larch Eastern Larch	Widespread	Increasing; common this year with some scattered moderate defoliation
Larch Sawfly *Pristophora erichosonii*			N.O.
Pine False Webworm *Acantholyda erythrocephala*	Red Pine		Common in 1989, but not observed this year
Pine Webworm *Tetralopha robustella*			N.O.
Red-Headed Pine Sawfly *Neodiprion lecontei*	Red Pine		N.O.

OTHER SOFTWOOD DEFOLIATORS

INSECT	HOST(S)	LOCALITY	REMARKS
Spruce Bud Moth *Zeiraphera canadensis*	White Spruce	Walden Waterville	Moderate infestations in two Christmas tree plantations; increasing
Spruce Budworm *Choristoneura fumiferana*			See narrative
White Pine Sawfly *Neodiprion pinetum*			N.O.
Yellow-headed Spruce Sawfly *Pikonema alaskensis*	White Spruce Red Spruce Blue Spruce	Waterville Danville St.Johnsbury Randolph	More reports than in 1989; Randolph plantation that suffered heavy damage in 1988 had only a few larvae early in the season; population here collapsed. Increasing elsewhere

Pear Thrips, Taeniothrips inconsequens, defoliated 26,773 acres that could be aerially mapped compared to 3,170 acres in 1989. Most of the damage occurred in Washington and Lamoille Counties (Table 8, Figure 10). As in the past, sugar maple was the primary host, but one stand in Camel's Hump State Forest had American beech overstory trees with upper crown damage severe enough to cause refoliation. Many of the sugar maples attacked by thrips early in the season were further damaged by one or more of the following agents later on: anthracnose, maple leaf cutter, maple webworm, and maple trumpet skeletonizer. The cumulative effect resulted in moderate defoliation for many trees that were near the upper end of the light category (i.e. 20-30% defoliation) for thrips damage. Mapped acreage is conservative due to the fact that thrips damage is so highly variable and undefined areas with a scattering of damaged trees are difficult to detect or map.

Refoliation associated with thrips damage was highly variable this year, even within stands. Some trees refoliated quickly while others refoliated partially or not at all. Year-to-year refoliation and damage trends for individual trees have been equally variable. This year, some trees had portions of their crowns that were heavily defoliated, while the remainder received little visible damage.

Table 8. Mapped Acres of 1990 Damage by Pear Thrips

County	Damage Level*			Total Acres
	Light	Moderate	Heavy	
Addison		335	335	670
Caledonia				0
Chittenden		780	905	1,685
Essex				0
Franklin		100	100	200
Grand Isle				0
Lamoille	2,374	5,257	1,361	8,992
Orange	3,104	855	188	4,147
Orleans				0
Washington	5,542	4,166	1,371	11,079
Total	11,020	11,493	4,260	26,773

*Damage based on leaf area reduction as follows:
Light = less than 30%; Moderate = 31-60%; Heavy = more than 60%.

OTHER SAPSUCKING INSECTS, MIDGES AND MITES

INSECT	HOST(S)	LOCALITY	REMARKS
Aphids Cinara sp.	Balsam Fir White Pine	Craftsbury Morristown E.Albany	Damaging 60 acres of Christmas trees
Aphids Periphyllus spp.	Many		Not detected this year; heavy in 1988, decreasing in 1989
Balsam Gall Midge Pardiplosis tumifex	Balsam Fir		See narrative
Balsam Twig Aphid Mindarus abietinus	Balsam Fir		See narrative
Balsam Woolly Adelgid Adelges piceae	Balsam Fir		N.O.
Beech Scale Cryptococcus fagisuga	Beech		See Beech Bark Disease
Birch Budgall Mite Aceria rudis	Birch		N.O.
Cooley Spruce Gall Adelgid Adelges cooleyi	White Spruce	Widely scattered	Decreasing; only trace populations in Christmas trees this year
Cottony Maple Scale Pulvinaria innumerabilis	Sugar Maple		N.O.
Eastern Spruce Gall Adelgid Adelges abietis	Red Spruce White Spruce	Widespread	Increasing; 82 acres of mostly mod-heavy damage to white spruce Christmas trees compared to 36 acres of light damage in 1989

OTHER SAPSUCKING INSECTS, MIDGES AND MITES

INSECT	HOST(S)	LOCALITY	REMARKS
Hemlock Woolly Adelgid *Adelges tsugae*	Hemlock		Not detected in northern region
Lacebugs *Corythucha sp.*	American Elm Balsam Poplar	Washington Orange Chittenden Counties	Decreasing, but damage noticeable along roads and streams
Leafhoppers	Sugar Maple Msc. hardwood	Widespread	Light damage noticeable
Lecanium Scale *Lecanium sp.*	Red Oak Sugar Maple		Not detected; was common in 1988
Maple Spindle Gall Mites *Vasates aceris-crumena*	Sugar Maple	Widespread	Remains common
Oystershell Scale *Lepidosaphes ulmi*	American Beech		See narrative
Pear Thrips *Taeniothrips inconsequens*	Sugar Maple		See narrative
Pine Bark Adelgid *Pineus strobi*	White Pine	Throughout	Heavily infested individual trees, common in widely scattered locations
Pine Leaf Adelgid *Pineus pinifoliae*	White Pine		N.O.
Pine Needle Midge *Contarinea baeri*	Scots Pine		N.O.
Pine Needle Scale *Chionapsis pinifoliae*	Mugho Pine	Morrisville	Trace levels

OTHER SAPSUCKING INSECTS, MIDGES AND MITES

INSECT	HOST(S)	LOCALITY	REMARKS
Pine Spittlebug *Aphrophora parallela*	Scots Pine White Pine Red Pine		156 acres of Christmas trees reported as infested; no shoot damage observed
Pine Thrips *Gnophothrips sp.*	Scots Pine		N.O.
Pine Tortoise Scale *Toumeyella parvicornis*	Scots Pine		N.O.
Root Aphid *Prociphilus americanus*	Balsam Fir Fraser Fir		N.O.
Spruce Bud Scale *Physokermes piceae*			N.O.
Spruce Spider Mite *Oligonychus ununguis*			N.O.
Treehoppers *Membracidae*			N.O.
Woolly Alder Aphid *Prociphilus tessellatus*	Silver Maple Alder		N.O.
Woolly Apple Aphid *Eriosoma lanigerum*	American Elm		N.O.

BUD, SHOOT, AND STEM INSECTS

The Balsam Shootboring Sawfly, Pleroneura brunneicornis, continued its past trend of heaviest populations in even years. This year damage was detected in 373 acres of balsam and Fraser fir, of which 213 acres were moderate to heavy. This compares to 48 acres of light to moderate damage in 1989. Some information from Maine Forest Service entomologists indicates that the adult sawflies may be laying eggs long before bud break. This would explain why we have not observed any adults in Vermont at or just before bud break when balsam twig aphid surveys are conducted.

OTHER BUD, SHOOT AND STEM INSECTS

INSECT	HOST(S)	LOCALITY	REMARKS
Allegheny Mound Ant *Formica exsectoides*	Scots Pine Douglas-Fir	Cornwall	Some mortality in Christmas tree plantation
Ambrosia Beetle *Scolytidae*	Paper Birch	Groton	Light damage
Balsam Shoot-boring Sawfly *Pleroneura brunneicornis*	Balsam Fir		See narrative
Butternut Curculio *Conotrachelus juglandis*			N.O.
Coneworm *Dioryctria spp.*	Fraser Fir Spruces		N.O.
Locust Borer *Megacyllene robiniae*			N.O.
Maple Petiole Borer *Caulocampus acericaulis*			N.O.
Northern Pine Weevil *Pissodes approximatus*			N.O.

OTHER BUD, SHOOT AND STEM INSECTS

INSECT	HOST(S)	LOCALITY	REMARKS
Pales Weevil *Hylobius pales*	Scots Pine	Widespread	Damage to Christmas trees similar to 1989, 170 acres of light to moderate damage reported
Pine Gall Weevil *Podapion gallicola*			N.O.
Pine Root Collar Weevil *Hylobius radicis*	Scots Pine	Cornwall	Causing about 5% mortality of 3'-5' tall Christmas trees
Pitted Ambrosia Beetle *Corthylus punctatissimus*	Sugar Maple Seedlings	Addison Chittenden Franklin Caledonia Orleans Counties	Present but decreasing compared to 1989
Pseudanthonomus validus	Yellow Birch		N.O.
Round-headed Apple Tree Borer *Saperda candida*	Apple	Victory Danville	Damaging apples in 5 homeowner locations
Twig Pruner *Elaphidionoides villosus*			N.O.
White Pine Weevil *Pissodes strobi*	White Pine Scots Pine Blue Spruce Norway Spruce White Spruce Red Spruce	Widespread	Common, but at decreased damage levels
White Spotted Sawyer *Monochamus scutellatus*			N.O.

BARK BEETLES

INSECT	HOST(S)	LOCALITY	REMARKS
Bronze Birch Borer *Agrilus anxius*			N.O.
Eastern Larch Beetle *Dendroctonus simplex*	Eastern Larch	Widespread	Decreasing; no new areas of larch decline detected this year compared to 46 acres in 1989 and 646 acres in 1988
Elm Bark Beetles *Hylurgopinus rufipes* *Scolytus multistriatus*	American Elm	Widespread	See Dutch Elm Disease
Pine Engraver *Ips pini*	Red Pine		N.O.

ROOT INSECTS

The Conifer Swift Moth, *Korsheltellus gracilis*, formerly called the Ghost Moth, continues to be found associated with feeding wounds on the roots of balsam fir and red spruce at high elevations in northern Vermont.

FOREST DISEASES

STEM DISEASES

Beech Bark Disease, caused by Cryptococcus fagisuga and Nectria coccinea var. faginata, became noticeable enough this year that 1,691 acres of damage was mapped in the Northeast Kingdom during the annual aerial survey (Table 9, Figure 11). This disease complex appeared to be on the increase in recent years, but this is the first time in many years that mortality and decline has been heavy enough to detect from the air. Elsewhere in the region, except for the Champlain Valley, scattered yellow crowns of infected beech trees were more evident than usual by mid to late summer.

Table 9. Mapped Acres of 1990 Beech Decline and Mortality Due To Beech Bark Disease.

County	Acres
Caledonia	742
Essex	703
Orleans	246
Total	1691

Scleroderris Canker, caused by Ascocalyx abientina, was not found in any new locations for the fourth consecutive year. A total of 53 Christmas tree plantations within the quarantine zone (Figure 12), and 92 red and Scots pine plantations in 18 towns bordering the quarantine area, were surveyed for the presence of the disease, all with negative results. The disease does not appear to be spreading outside of previously infected plantations, and within infested plantations the rate of spread remains slow.

The total number of plantations in the state known to be infected remains at 124, consisting of 106 red pine and 18 Scots pine plantations. This represents 842 and 150 acres respectively, for a total of 992 acres infected. Another six plantations were infected at one time, but have since had the disease eradicated or the trees cut. Some recent infection can be found within most of the quarantine zone.

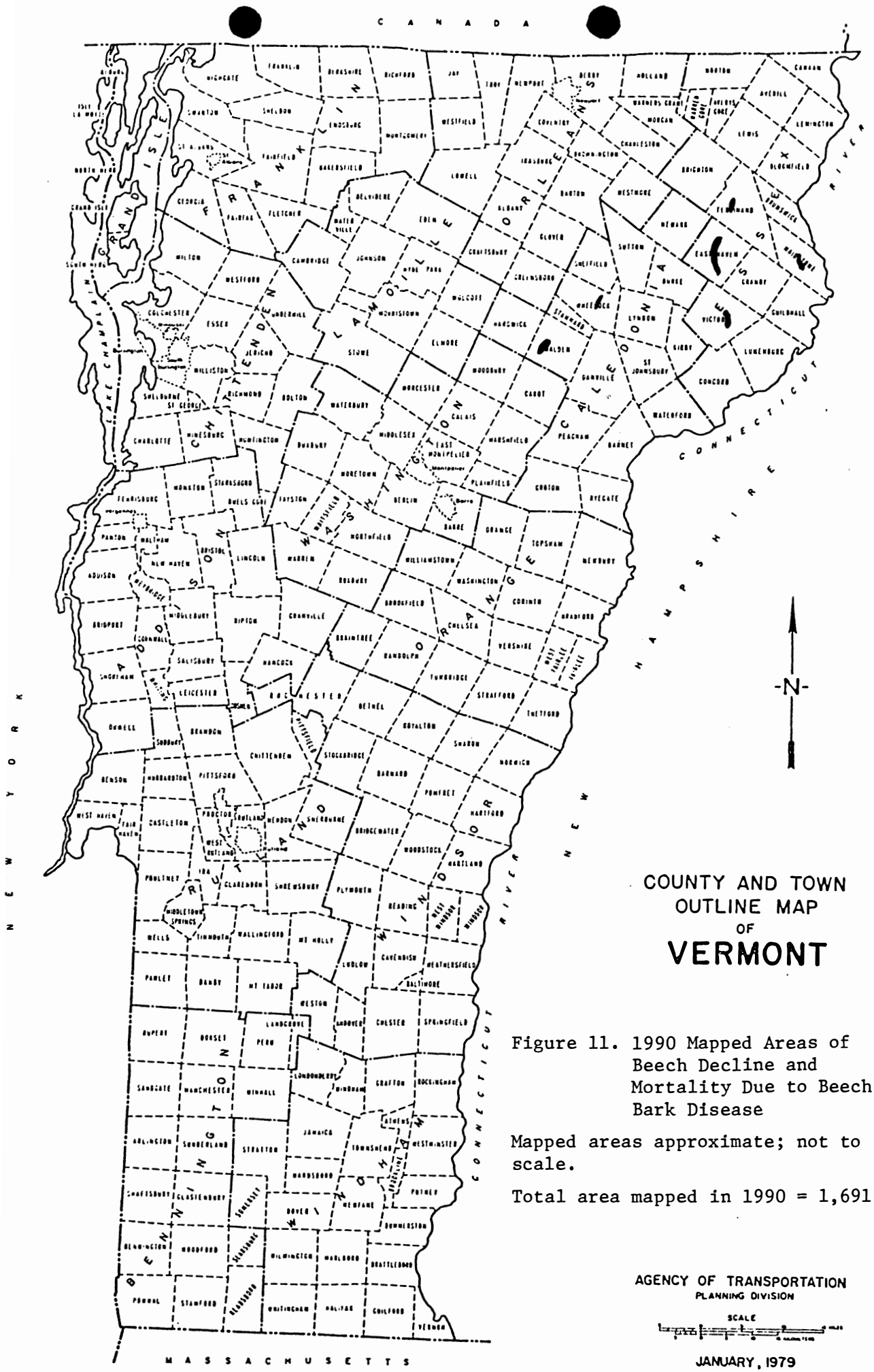

Figure 11. 1990 Mapped Areas of Beech Decline and Mortality Due to Beech Bark Disease

Mapped areas approximate; not to scale.

Total area mapped in 1990 = 1,691 acres

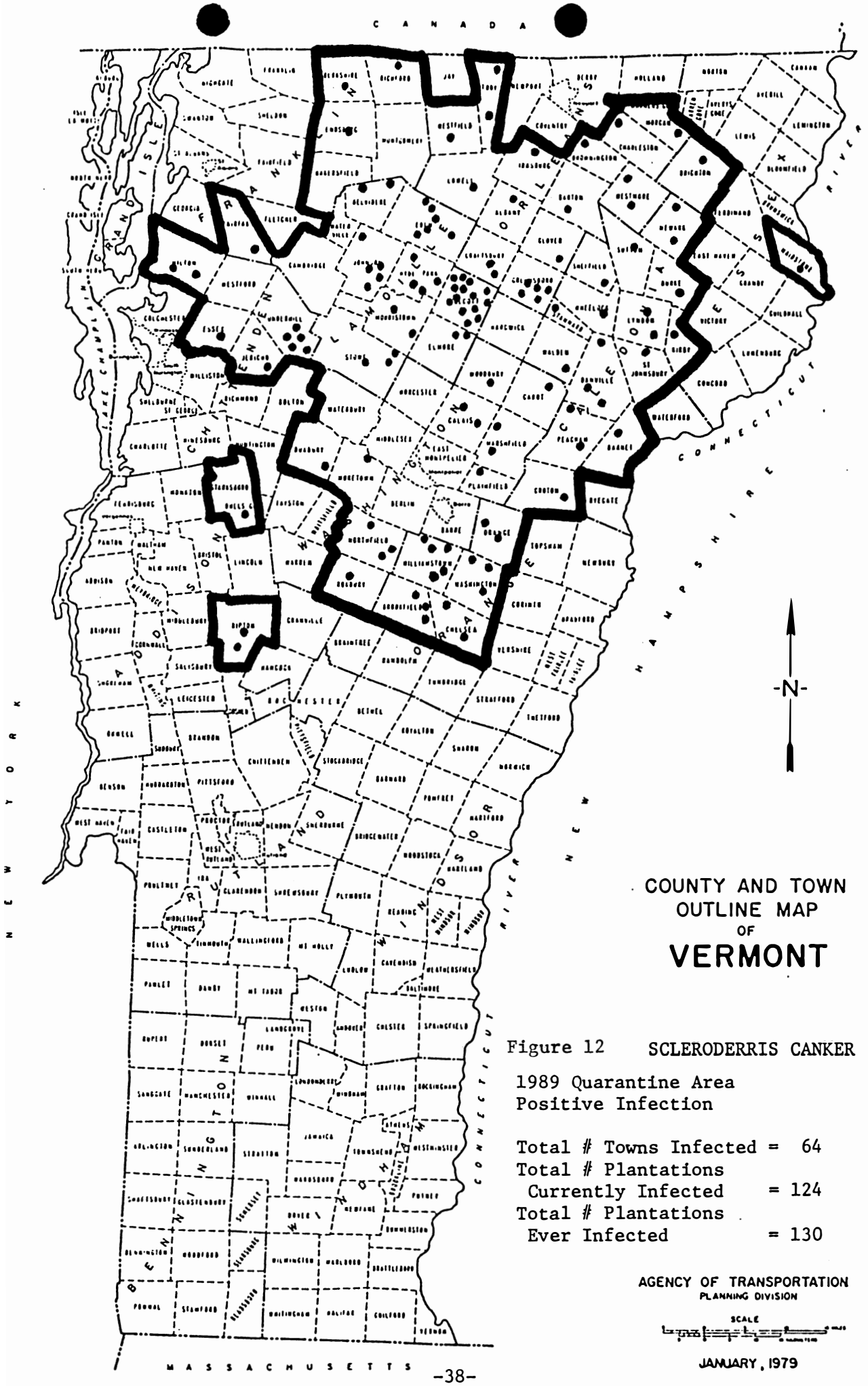

Figure 12 SCLERODERRIS CANKER

1989 Quarantine Area
Positive Infection

Total # Towns Infected = 64
Total # Plantations
Currently Infected = 124
Total # Plantations
Ever Infected = 130

AGENCY OF TRANSPORTATION
PLANNING DIVISION

SCALE

JANUARY, 1979

White Pine Blister Rust, caused by Cronartium ribicola, continues to cause some mortality of Christmas trees, ornamentals and regeneration. Damage was reported for 291 acres of Christmas trees in northern Vermont compared to 111 acres in 1989. Most of the damage was light, but 88 acres were moderately damaged. Blister rust damage in forest stands appears to be common, but stable.

OTHER STEM DISEASES

DISEASE	HOST(S)	LOCALITY	REMARKS
Annual Canker *Fusarium sp.*	Sugar Maple		N.O.
Balsam Fir Twig Abnormality *Sclerotinia kerneri*	Balsam Fir		N.O.
Beech Bark Disease *Cryptococcus fagisuga* and *Nectria coccinea* var. *faginata*			See narrative
Black Knot *Dibotryon morbosum*	Cherry	Widespread	Remains common
Butternut Canker *Sirococcus clavigignenta-juglandacearum*	Butternut		No new reports
Caliciopsis Canker *Caliciopsis pinea*	White Pine	Throughout	Remains common
Chestnut Blight *Cryphonectria parasitica*	Chestnut	Monkton	Several roadside trees affected
Cytospora Canker *Leucostoma Kunzei*	Blue Spruce	Widespread	Past damage still evident

OTHER STEM DISEASES

DISEASE	HOST(S)	LOCALITY	REMARKS
Diplodia Shoot Blight *Diplodia pinea* *(Sphaeropsis pinea)*	Red Pine	Bristol	Heavy damage to ornamental
Dutch Elm Disease *Ceratocystis ulmi*	American Elm	Throughout	Remains common
Eastern Dwarf Mistletoe *Arceuthobium pusillum*	Red Spruce		N.O.
Fir Broom Rust *Melampsorella caryophyllacearum*	Balsam Fir		N.O.
Fireblight *Erwinia amylovora*	Mountain Ash Apple Pear	Widely scattered	Increasing; numerous homeowner calls in St.Johnsbury area
Hypoxylon Canker *Hypoxylon pruinatum*	Quaking Aspen	Throughout	Remains common; trees frequently break off at canker during heavy snow and ice storms
Maple Canker *Steganosporium sp.* *Nectria sp.*			Not observed; was somewhat common in 1989 and abundant in 1988
Oak Wilt *Ceratocystis fagacearum*	Oaks		No suspects detected by trained observers during aerial flights
Sapstreak *Ceratocystis coerulescens*	Sugar Maple		N.O.
Scleroderris Canker *Asocalyx abietina*			See narrative

OTHER STEM DISEASES

DISEASE	HOST(S)	LOCALITY	REMARKS
Sirococcus Shoot Blight *Sirococcus strobilinus*	Red Pine		No new sites
Verticillium Wilt *Verticillium albo-atrum* or *V. dahliae*	Sugar Maple	St.Johnsbury	One ornamental maple affected
White Pine Blister Rust *Cronartium ribicola*	White Pine		See narrative
Woodgate Gall Rust *Endocronartium harknessii*	Scots Pine		Noticeably more abundant this year; caused mostly moderate damage to 200 acres of Christmas trees compared to 97 acres of mostly light to moderate damage in 1989

FOLIAGE DISEASES

Anthracnose, caused by Gloeosporium spp., was common everywhere on sugar maple and a variety of other hardwood species by mid to late summer. Damage to sugar maple was aerially detected on 1,938 acres in the Northeast Kingdom and 40 acres in Franklin County for a total of 1.978 acres (Table 10, Figure 13).

Table 10. Mapped Acres of 1990 Anthracnose Damage

County	Acres
Caledonia	1059
Essex	295
Franklin	40
Orleans	584
Total	1978

FOLIAGE DISEASES

DISEASE	HOST(S)	LOCALITY	REMARKS
Anthracnose *Gloeosporium spp.*	Sugar Maple		See narrative
Cedar-Apple Rust *Gymnosporangium juniperi-virginianae*	Eastern Red Cedar Apple		N.O.
Cyclaneusma Needlecast (formerly Naemacyclus) *Cyclaneusma minus*	Scots Pine	Throughout	Increasingly common; reported as a problem in 427 acres of Christmas trees compared to 68 acres in 1989 causing heavy needle loss in half of the plantations visited

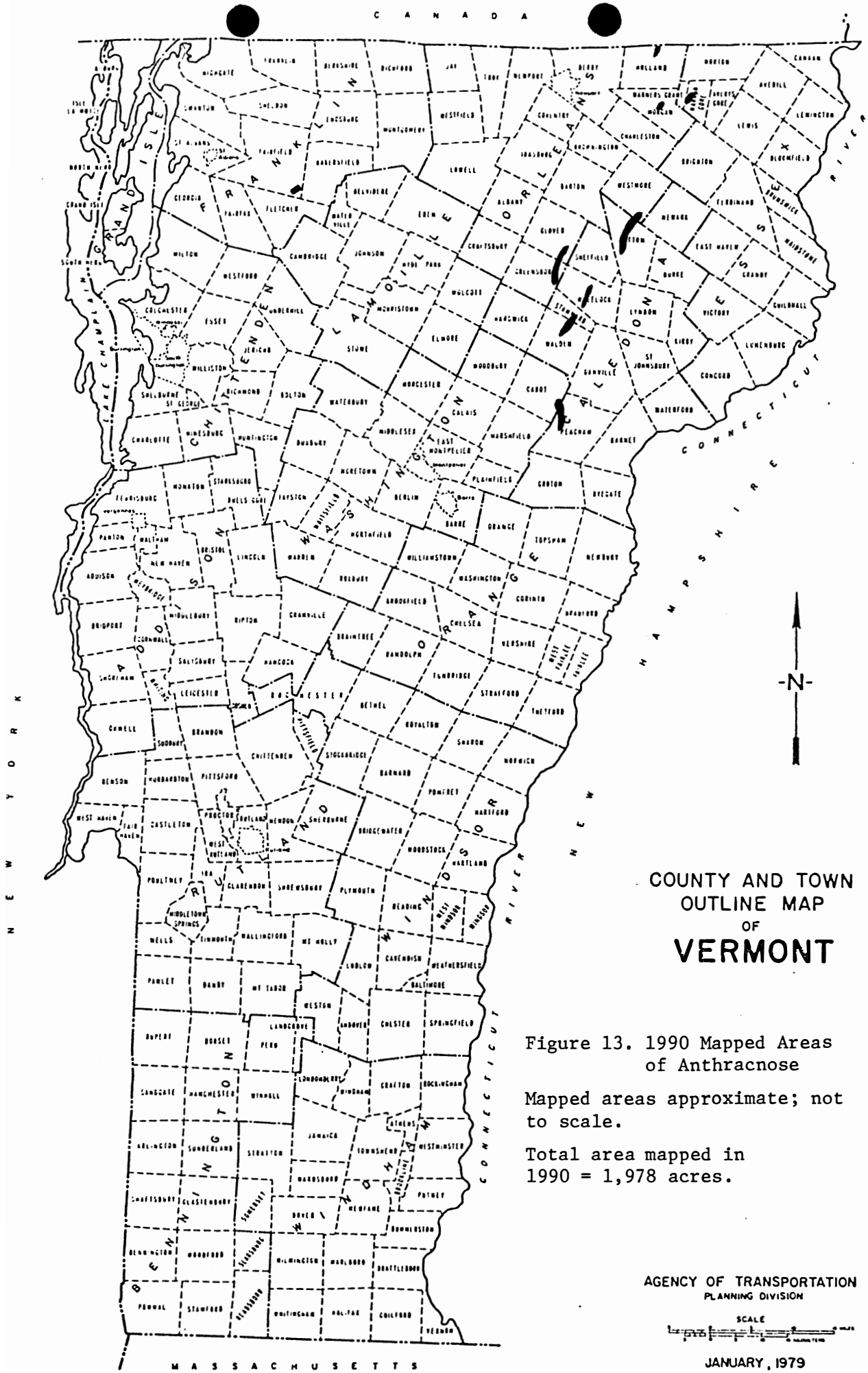

Figure 13. 1990 Mapped Areas of Anthracnose

Mapped areas approximate; not to scale.

Total area mapped in 1990 = 1,978 acres.

FOLIAGE DISEASE

DISEASE	HOST(S)	LOCALITY	REMARKS
European Larch Needlecast *Mycosphaerella laricina*	European Larch		N.O.
Fir-Fern Rust *Uredinopsis mirabilis*	Balsam Fir		Not observed despite rainy weather; temperatures during needle elongation probably too cool
Lophodermium Needlecast *Lophodermium seditiosum*	Scots Pine	Widely scattered	Presently less common than Cyclaneusma; detected in only two Christmas tree plantations (47 acres)
Poplar Leaf Bronzing Virus or virus-like causal agent	Balsam Poplar	Caledonia Orleans Counties	Remains common, but not as noticeable this year
Rhabdocline Needlecast *Rhabdocline pseudotsugae*	Douglas Fir	Waterbury	Remains present, causing some heavy needle loss
Rhizosphaera Needlecast *Rhizosphaera kalkhoffi*	Blue Spruce White Spruce	Widespread	Increasingly more common on Christmas trees and ornamentals
Swiss Needlecast *Phaeocryptopus gaumanni*	Douglas Fir	Brookfield Cornwall	Heavy damage to some Christmas tree plantations
Stigmina spp.	No. White Cedar	Concord	Smothering lower foliage of heavily mulched ornamentals
Tar Spot *Rhytisma acerinum*	Red Maple Sugar Maple	Throughout	Common this year

ROOT ROTS

DISEASE	HOST(S)	LOCALITY	REMARKS
Annosus Root Rot *Heterobasidion annosum*			N.O.
Shoestring Root Rot *Armillaria spp.*	Many	Throughout	Remains common on declining trees; appeared to be killing plantation white spruce in Washington

DIEBACKS, DECLINES AND ENVIRONMENTAL DISEASES

Ash Dieback remains common in the Champlain Valley area, especially where the basal area of white ash is substantial (i.e., 30% or more). Ash yellows, a mycoplasma-like organism, continues to be a factor in these lower elevation sites, especially in sites that are abandoned farm lands.

Birch Decline and scattered mortality remains noticeable in scattered locations, particularly in north-central Vermont. Dieback may be associated with past birch leaf miner defoliation in some areas.

Larch Decline associated with past outbreaks of the eastern larch beetle has largely subsided, although older dead trees are still noticeable. No new areas of larch decline were detected by aerial survey this year for the first time in many years. Ample rainfall during the past two years has probably been a major factor in this change. In 1988, 646 acres of new larch decline were detected, and this dropped to 46 acres in 1989.

Maple Decline continues to be a concern, but there were no new problem areas reported this year. Hardwood stands throughout much of the region, except for areas of moderate to heavy thrips defoliation, generally appeared to be in excellent health this year compared to past years. This was an excellent growing season due to the plentiful rainfall, and maple foliage generally stayed green a little later into the autumn than usual, with very little early leaf color noticeable this year.

Snow Damage from an early winter storm that began on 10 November caused unusually heavy limb and tree breakage throughout most of the region except for the Connecticut River Valley and Champlain Valley areas. Heavy winds following the storm continued to blow down trees, and many residences were without electrical power for up to a week. Pines and balsam fir were particularly heavily damaged. Fifteen acres of red pine (Howe Block) on state land in Waitsfield received heavy damage (i.e., probably 20% loss).

White Pine Needle Blight was largely absent for the third consecutive year. Only a few scattered white pines in Orange and Washington Counties were observed to have some symptoms of this malady on current year needles.

Winter Injury was common for some ornamentals this year, as well as for Christmas trees. Of the pine Christmas tree plantations inspected in northern Vermont, nearly half of them (337 acres) had some winter injury. Species affected were white pine, Scots pine, and white spruce. Moderate to heavy damage was reported for 234 acres, most of which was Scots pine. The unusually cold temperatures in December, 1989 when trees had not fully hardened off, are likely to have been a factor in this injury.

ANIMAL DAMAGE

ANIMAL	SPECIES DAMAGED	LOCALITY	REMARKS
Beaver	Many	Throughout	Populations remain high with flooding damage common
Deer			No damage reported
Moose			No damage reported
Mouse			N.O.
Porcupine	Many	Widely scattered	Increasing in Franklin, Chittenden and Addison counties, but stable or decreasing elsewhere
Sapsucker	White Birch Sugar Maple Norway Maple Hemlock	Widespread	Remains common
Squirrel	Maple Tubing	Widespread	Complaints decreasing

AGENCY OF NATURAL RESOURCES

DEPARTMENT OF FORESTS, PARKS AND RECREATION

STATE OF VERMONT

FOREST INSECT AND DISEASE CONDITIONS

SOUTHERN REGION

CALENDAR YEAR 1990

PREPARED BY: Barbara S. Burns, Specialist
Forest Resource Protection

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Forest Resource Protection
Technicians

INTRODUCTION

The information in this report is based on aerial surveys to detect defoliation, dieback and mortality; as well as ground surveys and observations of Forest Resource Protection personnel and other forestry staff.

Aerial surveys were flown in early June (6/5, 6/6, 6/12), mid-July (7/11, 7/12, 7/17), and late August (8/20, 8/22).

Diagnostic assistance was provided by the University of Vermont, Maine Forest Service, Pennsylvania State University, Connecticut Agricultural Experiment Station, Cornell University, and the U. S. Forest Service.

WEATHER SUMMARY

The winter of 1989-90 began with below zero temperatures in December, before much snow had accumulated. Winterburn showed up throughout the region as a result of these conditions.

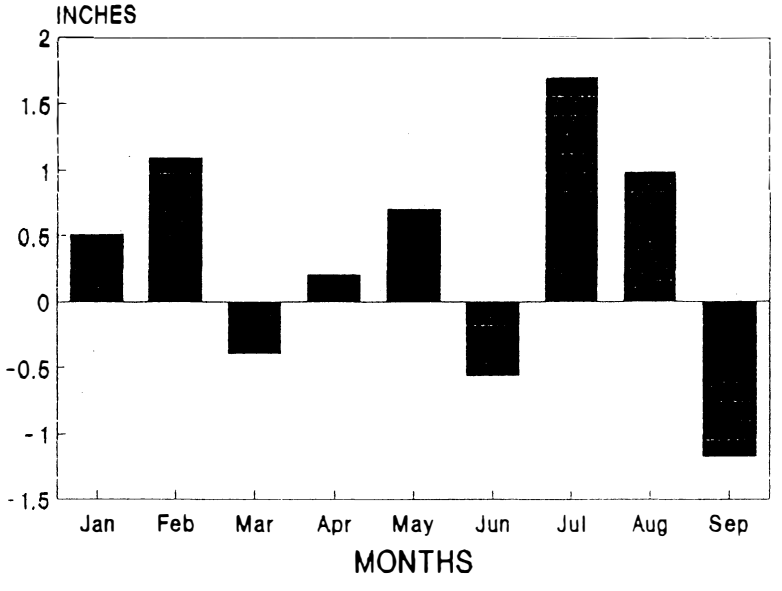
Spring began all at once in the southern part of the region, with temperatures in the 90's in late April. Further north, bud development began in late April, but slowed down with cool, wet weather in May. June and August had periods of rainy weather as well, resulting in another year of widespread fungus diseases.

Autumn foliage was bright, but was knocked off early by heavy winds and rain. Killing frosts did not occur until late October in parts of the region.

1990 was a good year for acorn production. Scattered white pines had an unusually heavy crop of cones.

Weather for the season is summarized in Figure 1. Phenology observations are summarized in Table 1.

Figure 1. 1990 Weather Summary: Burlington International Airport. Data from NOAA Monthly Climatological Data: Monthly Summary.



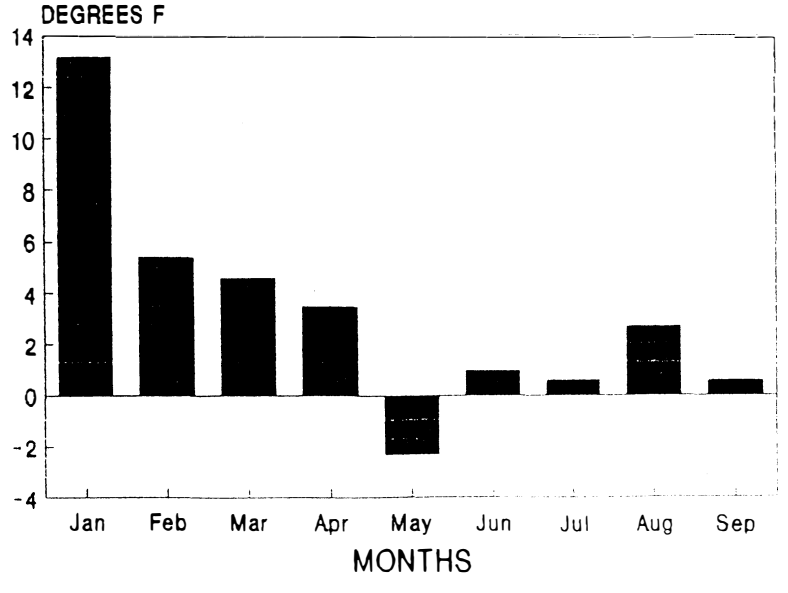


Table 1. 1990 Growing Degree Days and Observations of Phenological Development.

Growing Degree Days*			Phenology**				
Burlington	Albany		Sugar	Other Plants			Misc.
1990	1990	(Normal)	Maple	Budswell	Leaves	Flowers	
4/9	139					Popple Silver Maple	
4/16	139			No change			
4/23	143				Willow Cherry	Red Maple	
4/30	166	241 (167)	Leaves	Oak	Popple	Birch	Eastern Tent Caterpillar
5/7	218	296 (242)			Beech Oak	Oak	
5/14	261	352 (318)		W. Spruce Cottonwood	W. Pine	Apple	Gyspy Moth
5/21	307	410 (393)	Full Size		Hickory Ash		
5/28	360	474 (469)		Hemlock			Thrips Immatures
6/4	457	584 (570)			Hemlock		
6/11	543	685 (691)		Full Green Up			

* 86/50 calculations from UVM Entomology & Plant Pathology News or based on NOAA Local Climatological Data.

** Observations from southest Windsor County.

FOREST INSECTS

Hardwood Defoliators

Cherry Scallop Shell Moth, *Hydria prunivorata*, caused damage to cherries throughout the region. Heavy damage was observed in southern Windham and Bennington Counties. Towns with the heaviest damage included Bennington, Readsboro, Whitingham, Wilmington, and Woodford. Hillsides with a high relative stocking of cherry appeared brown.

Forest Tent Caterpillar, *Malacosoma disstria*, numbers declined from 1989, with only scattered individual larvae observed. Moth catches in pheromone traps were also down. Trap catch data will be included in the statewide report.

Gypsy Moth, *Lymantria dispar*, defoliation increased with 47,ØØØ acres mapped during aerial surveys, compared to 15,5ØØ acres in 1989. Most of the damage occurred in Bennington and Rutland Counties (Table 2, Map 1). Affected trees refoliated quickly.

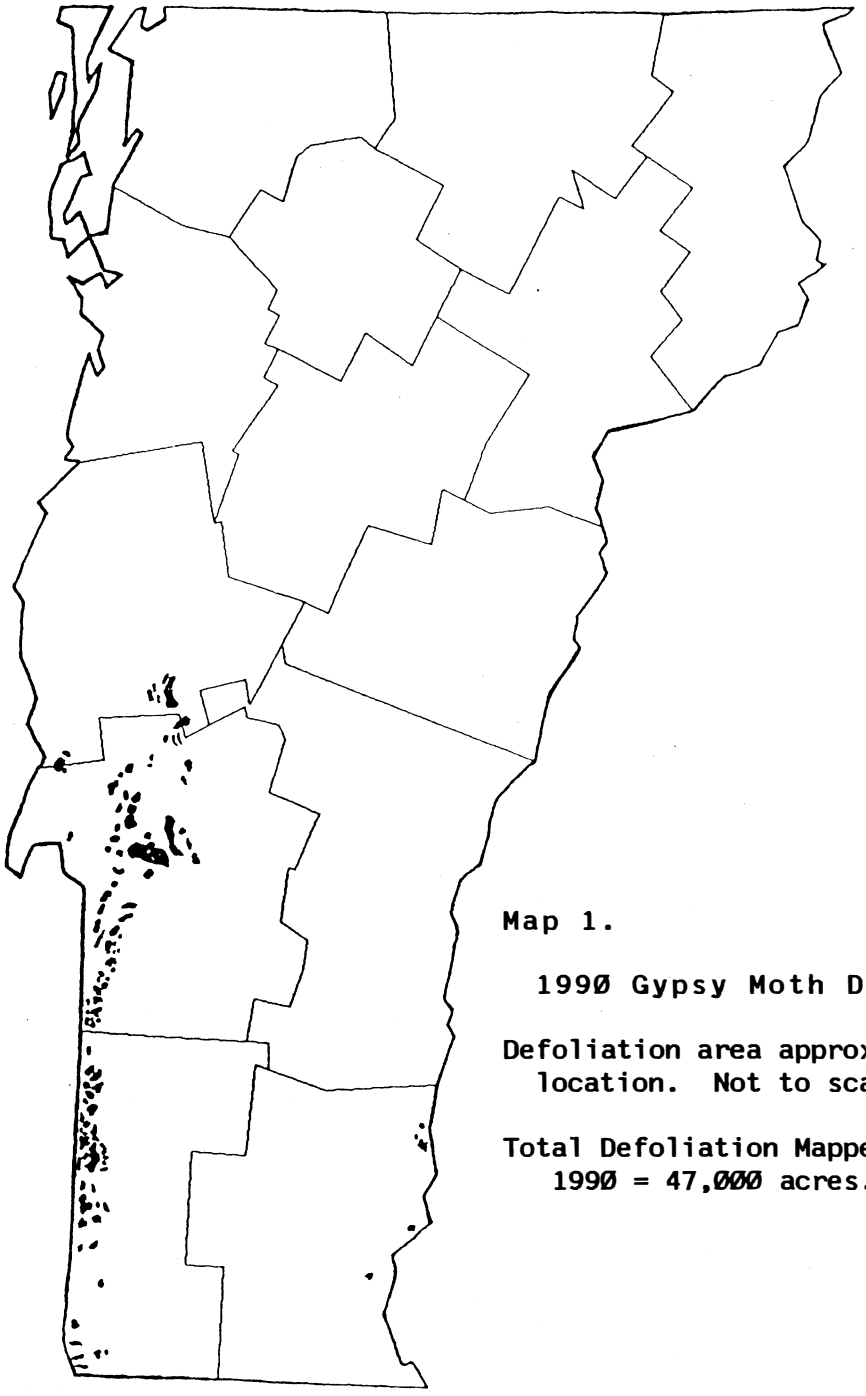
Although areas with high egg mass counts remain, populations have collapsed or failed to develop in much of the region. The fungal pathogen, *Entomophaga maimaiga*, is thought to be responsible for bringing the outbreak to a premature end over a large area. Heavy larval mortality was seen, beginning the third week of June. Larvae which survived often had thin or incomplete pupal cases. Mortality of females was apparently heaviest. Female moths were scarce in areas with many males, whose flight lasted longer than usual. Individual moths were seen flying as late as September. The general population decline is reflected in the data from focal area monitoring plots (Table 3).

Defoliation is expected in scattered locations in 1991. Surveys in Bennington and Rutland Counties indicate that populations are variable even within a single town. Egg masses are robust in some locations, but small and poorly formed in others. Counts made to date range from less than 1ØØ to over 7ØØØ per acre.

Maple Leaf Cutter, *Paraclemensia acerifoliella*, populations increased, with heavy damage occurring, particularly in central Windsor County. Together with anthracnose, pear thrips, and maple trumpet skeletonizer, this insect contributed to widespread browning of foliage that was mapped on 31ØØ acres, including a number of sugarbushes (Table 4, Map 2).

One 23 acre sugarbush in Hartford was aerially sprayed with Dipel 8AF at 16 b.i.u.s per acre. Insect counts were made before and after the application to monitor efficacy. Two 4-leaf cluster samples were taken from the mid-lower crown of ten codominant trees. The number of live larvae per leaf dropped by half from 1.9 pre-spray to Ø.9 post-spray (Table 5). Foliage protection was difficult to evaluate because of anthracnose. In general, foliage from the upper crown had only anthracnose damage, while foliage in the lower crown had moderate damage from maple leaf cutter.

1990
GYPSY MOTH DEFOLIATION
IN VERMONT



Map 1.

1990 Gypsy Moth Defoliation

Defoliation area approximate location. Not to scale.

Total Defoliation Mapped in 1990 = 47,000 acres.

Table 2. Mapped acres of defoliation by gypsy moth.

	Acres Defoliated		Acres Defoliated
Rutland County	23055	Bennington County	22500
Brandon	1200	Rupert	1500
Fair Haven	250	Sandgate	9300
Benson	500	Arlington	8850
Hubbardton	1900	Shaftsbury	500
Castleton	3350	Bennington	400
Ira	1725	Pownal	1950
Poultney	2430		
Wells	2250	Windham County	1400
Pawlet	3050		
Pittsford	2150	Bellows Falls	850
Proctor	900	Putney	300
Rutland Town	1000	Brattleboro	150
West Rutland	2350	Dummerston	100

Table 3. Gypsy moth counts from focal area monitoring plots 1986-1990.

Plot Location	# of Egg Masses 1986	1987	1988	1989	1990
Minards Pond	0	0	7	99	10
Fort Dummer	2	0	1	1	0
Handley Mountain	1	1	4	417	7
Perch Pond	0	115	226	168	1
Rocky Pond	0	6	53	>400	11
Petersburg	1	0	1	296	89
Tate Hill	0	0	6	498	5
Average	2	20	46	200	20

1. Total number in 15m diameter plots.
2. Average of 2 or 3 plots in 1986 and 2 plots in 1987 and 1988-1989.

Table 4. Acres of maple browning mapped in August caused by maple leaf cutter, anthracnose, maple trumpet skeletonizer, and pear thrips.

	Acres Mapped		Acres Mapped
Windsor County	285Ø	Rutland County	11Ø
Cavendish	2Ø	Tinmouth	5Ø
Chester	3Ø	Sherburne	2Ø
Woodstock	45Ø	Pittsfield	4Ø
Bridgewater	2ØØ		
Barnard	3ØØ		
Pomfret	5ØØ	Windham County	13Ø
Hartford	3Ø		
Hartland	3ØØ	Townshend	5Ø
Norwich	12Ø	Brookline	4Ø
Bethel	3ØØ	Grafton	4Ø
Royalton	35Ø		
Sharon	15Ø		

Table 5. Average counts of maple leaf cutter larvae and damage before and after aerial spraying with Bt on 7/6.

	Pre-Spray (6/19)	Post-Spray (7/18)	
# Live Larvae/Leaf	1.8	Ø.9	p=.Ø1
# Dead Larvae/Leaf	Ø.2	Ø.8	p=.Ø1
Average % of Larvae Dead	1Ø%	42%	p=.Ø1
# of Cuts/Leaf	2.2	2.5	n.s.

Oak Leaf Tier, *Croesia semipurpurana*, was not observed causing any damage. However, moths were collected this year in pheromone traps (Table 6).

Saddled Prominent, *Heterocampa guttivata*, populations increased, with 2,800 acres of defoliation mapped from the air (Table 7, Map 3). Larval activity was heavy in scattered locations throughout the region, although much of the defoliation was confined to upper crowns. Little damage is expected next year. Very few pupae have been found in the soil, even in areas which had high larval populations. It is expected that a fungal pathogen is responsible for the collapse.

Satin Moth, *Leucoma salicis*, caused heavy damage to poplars and willows in early June. Damage was observed in widely scattered locations throughout the region. Cottonwoods in riparian areas were most commonly defoliated.

HARDWOOD DEFOLIATORS

INSECT	HOST(S)	LOCALITY	REMARKS
Birch Leaf Miner *Fenusa pusilla*	White Birch Grey Birch	Throughout	Only scattered damage.
Birch Leaf Folder *Ancylis discigerana*			Not observed.
Birch Skeletonizer *Bucculatrix canadensisella*			Not observed.
Bruce Spanworm *Operophtera bruceata*	Sugar Maple	Hartland	Moderate defoliation in a sugarbush. Associated with pear thrips.
Eastern Tent Caterpillar *Malacosoma americanum*	Apple Cherry	Throughout	Population continues to be down from 1988.
Elm Leaf Beatle *Pyrrhalta luteola*	Elm	Rutland	Adults observed.
Euonymus Caterpillar *Yponomeuta multipunctella*	Euonymus	Springfield	Ornamental.
European Snout Weevil *Phyllobius oblongus*	Walnut	Rockingham	Ornamental.

Table 6. Oak leaf tier in pheromone traps 1988-1990.

Location	# of Moths/Trap*		
	1988	1989	1990
Brattleboro	40	0	1.3
Brigham Hill	-	-	0.3
Rockingham	60	0	1.3
Rupert	-	0	0
Sandbar	-	-	0

* Average of three traps, except Rockingham in 1988.

Table 7. Mapped acreage of defoliation by saddled prominent.

	Acres Mapped		Acres Mapped
Bennington County	1530	Windham County	1250
Readsboro	350	Somerset	40
Stamford	900	Wilmington	900
Woodford	80	Halifax	200
Searsburg	200	Newfane	30
		Marlboro	80

OTHER HARDWOOD DEFOLIATORS

INSECT	HOST(S)	LOCALITY	REMARKS
Fall Cankerworm *Alsophila pometaria*			Not observed.
Fall Webworm *Hyphantrea cunea*	Hardwoods	Throughout	Observed on cherries and apples in forest situations. Heavy on scattered roadside trees.
Forest Tent Caterpillar *Malacosoma disstria*			See narrative.
Green Striped Mapleworm *Anisota rubicunda*			Not observed.
Gypsy Moth *Lymantria dispar*			See narrative.
Half Winged Geometer *Phigalia titea*			Not observed.
Japanese Beetle *Popillia japonica*	Hardwoods	Ludlow	Golf course with grub damage to turf.
Large Aspen Tortrix *Choristoneura conflictana*			Not observed.
Linden Looper *Erranis tiliaria*			Not observed.
Locust Leaf Miner *Odontata dorsalis*			Not observed.
Maple Leaf Cutter *Paraclemensia acerifoliella*			See narrative.

OTHER HARDWOOD DEFOLIATORS

INSECT	HOST(S)	LOCALITY	REMARKS
Maple Trumpet Skeletonizer *Epinotia aceriella*	Sugar Maple	Throughout	Very heavy in scattered locations, particularly Windsor County. See Maple Leaf Cutter.
Maple Webworm *Tetralopha asperatella*			Not observed.
Maple Petiole Borer *Caulocampus acericaulis*	Sugar Maple	Weston	Forest situation.
Mountain Ash Sawfly *Pristophora genicultata*			Not observed.
Pear Slug *Caliroa cerasi*	Cherry	Ludlow	Ornamental.
Pin Oak Sawfly *Caliroa sp.*			Not observed.
Saddled Prominent *Heterocampa guttivata*			See narrative.
Satin Moth *Leucoma salicis*			See narrative.
Solitary Leaf Roller *Sparganothis pettitana*	Sugar Maple	Rutland County	Associated with maple leaf cutter.
Spring Cankerworm *Paleacrita vernata*			Not observed.
Uglynest Caterpillar *Archips cerasivoranus*	Cherry	Stockbridge	Isolated infestation.

Softwood Defoliators

Hemlock Looper, *Lambdina sp.*, is thought to be responsible for defoliating 5-10 acres of hemlock in Vernon. Defoliation was first observed in July. Needle loss was more severe in the older foliage of upper crowns, however, some trees were completely brown by November. Samples are being analyzed by the Maine Forest Service.

Larch Casebearer, *Coleophora laricella*, caused less widespread damage this year than in 1989. However, 250 acres of tamarack in Rutland County (Clarendon) and 100 acres in Bennington County (Bennington and Dorset) were defoliated.

OTHER SOFTWOOD DEFOLIATORS

INSECT	HOST(S)	LOCALITY	REMARKS
Arborvitae Leaf Miner *Argyresthia thuiella*	Arborvitae	Rutland	Less common than 1989.
European Pine Sawfly *Neodiprion sertifer*	Scots Pine	Weathersfield	Christmas trees.
Introduced Pine Sawfly *Diprion similis*	Scots Pine	Hubbardton	Numerous enough on Christmas trees to require control.
	White Pine	Windsor County	Observed occasionally.
Larch Casebearer *Coleophora laricella*			See narrative.
Larch Sawfly *Pristophora erichosonii*			Not observed.
Spruce Budworm *Choristoneura fumiferana*			Not observed.

OTHER SOFTWOOD DEFOLIATORS

INSECT	HOST(S)	LOCALITY	REMARKS
Spruce Coneworm *Dioryctria reniculleloides*	White Spruce Fraser Fir	Rutland	Light damage to Christmas trees.
Spruce Webspinning Sawfly *Cephalacia fascipennis*	White Spruce	Sharon	Isolated nest in Christmas trees.

Sapsucking Insects, Midges, and Mites

Balsam Gall Midge, *Paradiplosis tumifex*, caused more widespread damage this year, with light damage seen in scattered Christmas tree plantations and forest stands throughout the region. In one plantation, sprayed with Diazinon AG5ØØ when growth was 3/4" long, sprayed trees averaged 1.9 galls per cm. of shoot, while unsprayed trees averaged 2.4 galls per cm..

Galls from infested trees in Weston were examined to determine whether *Dasineura balsamicola* was present. *D. balsamicola* was found in one-quarter of the galls.

Balsam Twig Aphid, *Mindarus abietinus*, was widespread again this year, with many Christmas tree growers spraying to prevent needle curling and sooty mold. Eggs were counted in two plantations in late March (Table 8).

Hemlock Woolly Adelgid, *Adelges tsugae*, was introduced to the state on tublings which had been maintained in New Jersey prior to outplanting in Stockbridge. Identification was confirmed by the Connecticut Agricultural Experiment Station. Approximately 14Ø-2ØØ tublings were planted on a cleared hilltop site in early May and early July. Some of the trees are known to have died shortly after planting. In mid-July, when the infestation was detected, 12Ø seedlings were pulled and destroyed. Ten percent of these were obviously infested with adelgid. A systematic survey was done in early September, when 9 infested and 11 non-infested seedlings were pulled and destroyed.

The chance for eradicating the infestation is good. The planting site is at a high elevation, where native hemlock does not occur in the surrounding forestland. Additional scouting surveys will be done in 1991 in and around the planting area.

To continue monitoring the state for other possible infestations, a subsample of the 1989 systematic survey plots was reexamined for hemlock woolly adelgid. Six of the thirty-eight original plots were revisited. No adelgids were detected (Map 4).

Pear Thrips, *Taeniothrips inconsequens*, caused more damage this year than in 1989. Overwintering soil counts, spring bud counts (Figure 2), and acres of damage mapped during aerial surveys (Table 9, Map 5) all increased from 1989.

Damage was negligible in most of Bennington, Rutland, and Windham Counties where green-up occurred very quickly in late April. However heavy damage did occur in Windham County in isolated mid-elevation sites. More widespread (mostly moderate) damage occurred in Windsor County, where green-up at mid- to upper-elevations was delayed due to a long cold period in early May. Aerial survey results may not accurately reflect actual conditions, because defoliation was difficult to detect against the delayed green-up of late-flushing species.

Refoliation of sugar maple was well underway the week of June 18. Complete refoliation occurred where individual trees were heavily damaged. However, many moderately damaged maple stands and sugarbushes in Windsor County did not refoliate. Thin crowns and brown leaves from thrips damage became more visible as the season progressed (see Maple Leaf Cutter).

Figure 2. Average thrips counts in buds of sugar maple regeneration 1986-1990. Average of 2 sugarbushes in 1986 and 6 sugarbushes in 1987-1990 (100 buds/sugarbush).

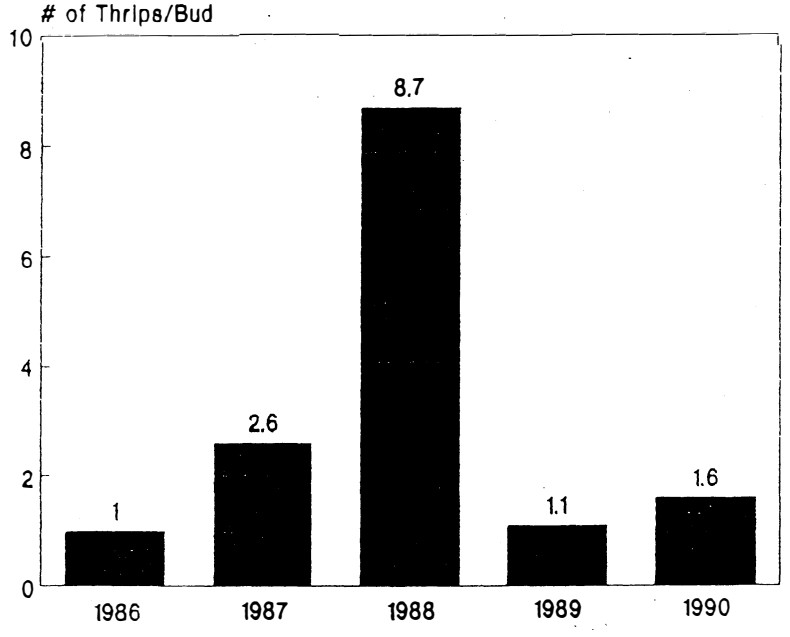


Table 8. March egg counts and subsequent damage by balsam twig aphid in two plantations.

Location	# viable eggs/ cm. of shoot	% of eggs which were viable	Needle Damage Observed
Dummerston	.24	64%	moderate
Whitingham	.Ø4	31%	light

Table 9. Mapped acres of damage by pear thrips.

	Acres Mapped		Acres Mapped
Rutland County	125	Windham County	325Ø
Clarendon	4Ø	Brattleboro	35Ø
Hubbardton	25	Dummerston	2ØØ
Pawlet	1Ø	Guilford	25Ø
Poultney	5Ø	Halifax	7ØØ
		Marlboro	75Ø
		Putney	15Ø
		Townshend	2ØØ
		Westminster	165Ø

In addition to sugar maple, damage to red oaks and black cherries was observed in Windham County. In red oak, the damage was associated with anthracnose. Black cherry damage resulted in normal-looking leaves being dropped from the tree.

Pine Bark Adelgid, *Pineus strobi*, was unusually heavy on white pine throughout the region. Most commonly affected were ornamentals and overstocked forest trees. In some areas, severe chlorosis of 1989 needles occurred early in the season associated with this insect.

Spruce Spider Mite, *Oligonychus ununguis*, damage, from 1989 feeding, was seen in widely scattered locations on spruce and fir Christmas trees early in the season. In general, infested plantations had more hatched eggs than current eggs, indicating declining populations. Scattered light damage, from 1990 feeding, was observed on hemlock and spruce.

OTHER SAPSUCKING INSECTS, MIDGES & MITES

INSECT	HOST(S)	LOCALITY	REMARKS
Aphids *Periphyllus sp.*	Sugar Maple	Brandon	Numerous, with heavy honeydew, on ornamentals which are routinely sprayed with carbaryl.
Aphids *Cinara sp.*	Blue Spruce	Brattleboro	Heavy on ornamentals.
Balsam Gall Midge *Paradiplosis tumifex*			See narrative.
Balsam Twig Aphid *Mindarus abietinus*			See narrative.
Balsam Woolly Aphid *Adelges piceae*			Not observed.
Cooley Spruce Gall Aphid *Adelges cooleyi*	Douglas Fir White Spruce Blue Spruce	Throughout	Douglas fir damage in scattered locations. Lighter than previous years.
Eastern Spruce Gall Aphid *Adelges abietis*	Red Spruce White Spruce	Throughout	Continues to be common on white spruce Christmas trees, with heavy damage to scattered individuals.

OTHER SAPSUCKING INSECTS, MIDGES & MITES

INSECT	HOST(S)	LOCALITY	REMARKS
Hemlock Woolly Adelgid *Adelges tsugae*			See narrative.
Leaf Stem Gall Aphid *Phylloxera caryaecaulis*	Hickory	Springfield	Ornamentals.
Oystershell Scale *Lepidosaphes ulmi*	Beech	Wilmington	Noticeable damage in a forested area mapped during aerial surveys.
Pear Thrips *Taeniothrips inconsequens*			See narrative.
Pine Bark Adelgid *Pineus strobi*			See narrative.
Pine Needle Midge *Contarinea baeri*			Not observed.
Pine Spittlebug *Aphrophora parallela*	White Pine Scots Pine	Throughout	Heavy again in 1990. Moderate shoot mortality on Scots Pine Christmas trees in Putney from 1989 feeding.
Root Aphid *Prociphilus americanus*			Not observed.
Spruce Spider Mite *Oligonychus ununguis*			See narrative.

Bud, Shoot and Stem Insects

White Pine Weevil, *Pissodes strobi*, continued to cause widespread terminal shoot mortality in conifers. Dimilin, formulated with propylene glycol and superior oil, was tested on white pine by Christmas tree growers in Whitingham and Shrewsbury, in cooperation with the Maine Forest Service. In both plantations, 100% control was achieved. In the Whitingham site, 6% of the leaders had been damaged in 1989, and wild trees adjacent to the treated area were damaged by weevil in 1990. In the Shrewsbury site, additional Scots pines were treated with lindane. No weevil damage occurred to the lindane-treated trees either.

OTHER BUD, SHOOT & STEM INSECTS

INSECT	HOST(S)	LOCALITY	REMARKS
Allegheny Mound Ant *Formica exsectoides*	White Spruce	Athens	Christmas trees.
Black Walnut Curculio *Conotrachelus retentus*	English Walnut	Rockingham	Persistent infestation in small orchard.
Broad Necked Root Borer *Prionus laticollis*	Oak	Springfield	Ornamentals.
Horned Oak Gall *Callirhytis cornigera*	Red Oak	Barnard	Regneration.
Northern Pine Weevil *Pissodes approximatus*			Not observed.
Pales Weevil *Hylobius pales*			Not observed.
Poplar Gall Saperda *Saperda inornata*	Quaking Aspen	Dummerston	Heavy infestation of 10-12' regeneration in aspen clearcut.
Round Headed Apple Tree Borer *Saperda candida*	Apple Mountain Ash	Reading Weston	Ornamentals.

OTHER BUD, SHOOT & STEM INSECTS

INSECT	HOST(S)	LOCALITY	REMARKS
Sugar Maple Borer *Glycobius speciosus*	Sugar Maple	Cavendish Bridgewater	Sugarbush. Many old injuries in sawtimber stand.
White Pine Weevil *Pissodes strobi*			See narrative.
Zimmerman Pine Moth *Dioryctria zimmermanni*	Scots Pine	Springfield	Heavy damage to ornamentals.

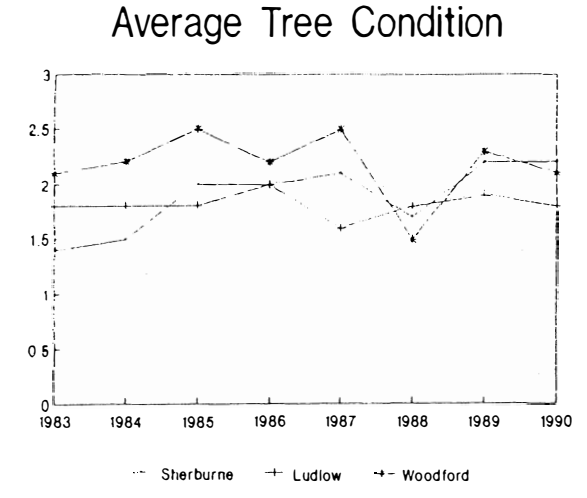
BARK BEETLES

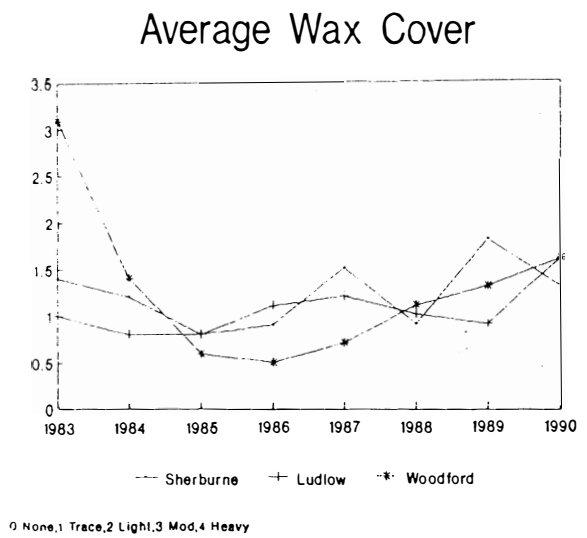
INSECT	HOST(S)	LOCALITY	REMARKS
Bronze Birch Borer *Agrilus anxius*	White Birch	Springfield	Recent transplants.
Elm Bark Beetles *Hylurgopinus rufipes* *Scolytus multistriatus*	American Elm	Widespread	See Dutch Elm Disease.
Pine Engraver *Ips pini*	White Pine	Throughout	Associated with decline and mortality on wet sites and where planted too deep.
Red Turpentine Beetle *Dendroctonus valens*	White Pine	Jamaica Springfield	Associated with white pine blister rust or recent cutting.
White Pine Bark Miner *Marmara fasciella*	White Pine	Athens	Associated with mortality of suppressed regeneration.

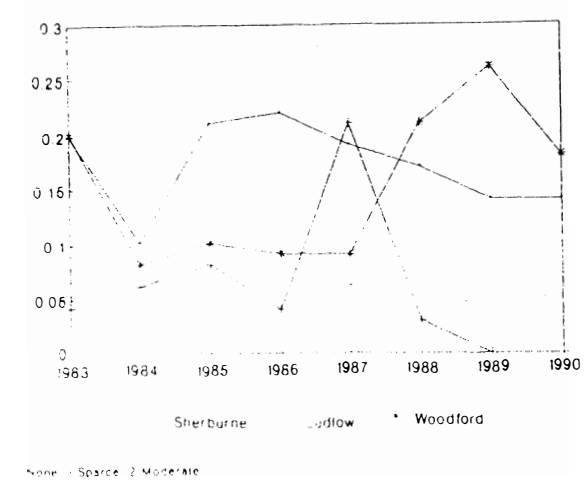
STEM DISEASES

DISEASE	HOST(S)	LOCALITY	REMARKS
Balsam Fir Twig Abnormality *Sclerotinia kerneri*	Balsam Fir	Mt. Holly	Causing dieback.
Beech Bark Disease *Cryptococcus fagisuga* and *Nectria coccinea* var. *faginata*	Beech	Throughout	Steady at low levels in monitoring plots (Fig. 3). Scattered dieback and chlorosis throughout.
Caliciopsis Canker *Caliciopsis pine*	White Pine	Throughout	Associated with overstocked or off-site trees.
Canker Rot *Cerrena unicolor*	Sugar Maple	Woodstock	Associated with sudden mortality of a shade tree stressed by drought and a girdling root.
Cytospora Canker *Cytospora kunzei*	Spruce	Widespread	Less common than other years.
Diplodia Shoot Blight *Sphaeropsis sapinea*	Red Pine	Throughout	Scattered through a 15 year old plantation.
Dutch Elm Disease *Ceratocystis ulmi*	Elm	Throughout	Flagging common by late June.
Fireblight *Erwinia amylovora*	Cherry	Sunderland	Isolated infection.
Hypoxylon Canker *Hypoxylon pruinatum*	Quaking Aspen	West Rutland Pittsford	Heavy damage.
Oak Wilt *Ceratocystis fagacearum*	Oaks	Absent	No suspects seen by trained observers during aerial flights.

Figure 3. Summary of beech bark disease monitoring plots 1983-1990.







OTHER STEM DISEASES

DISEASE	HOST(S)	LOCALITY	REMARKS
Sapstreak *Ceratocystis coerulescens*	Sugar Maple	Guilford Bethel	Staining seen associated with mortality in recently thinned stands.
Scleroderris Canker *Gremmeniella abietina*			Not observed.
Smoth Patch *Dendrothele macrodens*	Ash	Woodstock Barnard	Slow-growing trees.
Verticillium Wilt *Verticillium albo-atrum*			Not observed.
White Pine Blister Rust *Cronartium ribicola*	White Pine	Throughout	Scattered mortality in pole-sized stand in Westminster.

Foliage Diseases

Anthracnose was widespread in the region this year. Most symptoms showed up following the cool, wet weather in May, or following a rainy period in mid-August. High levels of anthracnose in 1989 left plenty of fungus inoculum to take advantage of wet conditions.

Maple Anthracnose, caused by *Gloeosporium sp.*, caused scattered browning earlier in the season, especially in Windham County. Damage was much more extensive in mid-August. Browning by anthracnose and several insects was mapped on 3100 acres (see Maple Leaf Cutter).

Oak Anthracnose, caused by *Apiognomonia quercina*, was widespread, with symptoms showing up in early June. Most of the damage observed was in the Connecticut valley. Damage was irregular, with scattered trees being completely browned, while neighbors were browned at the top only or not at all. Symptomatic trees refoliated by mid-July.

Sycamore Anthracnose, caused by *Apiognomonia venata*, was unusually severe. Complete defoliation and scattered shoot mortality were widespread particularly in Bennington and Windham Counties. Refoliation began by mid-June, but sycamores remained tufted throughout the season.

Other anthracnose diseases seen in 1990 included *Gloeosporium betulae-luteae* on yellow birch in Bennington and *Gnomoniella carpina* on hophornbeam in Windsor County.

Lophodermium Needlecast, caused by *Lophodermium pinastri*, caused heavy damage to Scots pine Christmas trees in scattered locations. In two plantations, where needlecast was associated with winterburn, damage was so severe that some trees were culled. Lophodermium was also seen causing premature needlecast on white pine in Woodstock.

OTHER FOLIAGE DISEASES

DISEASE	HOST(S)	LOCALITY	REMARKS
Anthracnose *Gloeosporium* spp.			See narrative.
Apple Scab *Venturia inequalis*	Apple Mountain Ash	Norwich Chester Westminster	
Bulls Eye Spot *Cristulariella moricola*	Boxelder Norway Maple	Norwich Windsor	Not affecting adjacent sugar maples.

OTHER FOLIAGE DISEASES

DISEASE	HOST(S)	LOCALITY	REMARKS
Cyclaneusma Needlecast *Cyclaneusma minus*	Scots Pine	Putney Pownal	Moderate defoliation of Christmas trees.
Juniper Blight *Cercospora sequoiae-juniperi* *Phomopsis juniperovona*		Chester Ludlow Hartford	Damage to nursery and landscape shrubs.
Powdery Mildew *Microsphaera syringae*	Lilac	Norwich	Heavy infection.
Rhabdocline Needlecast *Rhabdocline pseudotsugae*	Douglas Fir	Springfield	Observed in one Christmas tree plantation. Down from previous years.
Rhizosphaera Needlecast *Rhizosphaera kalkhoffi*	White Spruce	Springfield Dummerston Baltimore	Light damage in Christmas tree plantations.
Septoria Leaf Spot *Septoria mussiva*	Balsam Poplar	Widespread	Heavy defoliation in mid August. Some refoliation.
Swiss Needlecast *Phaeocryptopus gaumani*	Douglas Fir	Brattleboro Springfield	Moderate damage.
Willow Scab *Venturia saliciperda*	Willow	Widespread	Heavy defoliation, especially in Clarendon.

ROOT ROTS

DISEASE	HOST(S)	LOCALITY	REMARKS
Annosus Root Rot *Heterobasidion annosum*	Red Pine	Guilford	Several infection centers in an over-stocked stand.
Brown Root Butt Rot *Phaeolus schweinitzii*	White Pine	Wallingford	Causing butt rot in healthy, understocked white pine.
	Red Spruce	Weston	Causing pockets of windthrow on a wet site.
Shoestring Root Rot *Armillaria mellea*	Norway Spruce	Woodstock	Occasional dieback and mortality.
	Balsam Fir	Shrewsbury	Scattered individuals.
	White Pine	Castleton	Mortality in one clump of trees.

DIEBACKS DECLINES & ENVIRONMENTAL DISEASES

ASH DIEBACK and mortality remains common, continuing at steady levels. Ash dieback is particularly noticeable in hedgerow trees.

BIRCH DECLINE is still noticeable at upper elevations in Windsor County, but symptoms are improving in most of the region. Low levels of birch leaf miner in recent years have reduced the stress on birch.

DROUGHT conditions in 1988 continue to cause losses, particularly among landscape trees. Ornamental maples with girdling roots, sugarbushes on shallow sites, and trees disturbed by grade changes or wounding developed new dieback or died in 199Ø. Drought effects are known to persist for several years following a dry year.

EDEMA symptoms were seen on the needles of balsam fir Christmas trees growing on wet sites in Bennington and Springfield. The wet spring of 1989 is thought to be responsible for the symptoms, which were first observed during winter 1989-9Ø.

FROST INJURY was observed on maples at higher elevations in Mendon, Sherburne, Rupert, and Sunderland. Balsam fir Christmas trees in Windham had light damage. Many needles were constricted in the middle, where young tissue was weakened by cold temperature. Later on, needles with heavier damage broke at the constriction.

HERBICIDE INJURY was seen in several locations. Roundup injured Douglas fir Christmas trees in two plantations, causing pockets of mortality. Dicamba injured ornamental spruce on a golf course. Ronstar injured a variety of species in a small nursery. Princep is thought to be the cause of chlorosis in a white spruce Christmas tree plantation.

IMPROPER PLANTING continues to be a source of dieback and mortality. In some cases, symptoms have only recently shown up on trees that were transplanted several years ago. Again, it is suspected that the dry conditions two years ago contributed to the decline. Among the situations encountered were white spruce Christmas trees, town street trees, and ornamentals planted too deep. The scattered occurrence of mortality and dieback associated with girdling roots suggests that more careful planting in the past would have increased longevity.

LARCH DECLINE was observed in Clarendon, Tinmouth, and Danby in stands that have had mortality in the past. Recent defoliation by larch casebearer is probably responsible for the decline.

MAPLE DECLINE continues to be a concern. Monitoring continued in plots established as part of the North American Sugar Maple Decline Project.

In general, maples continued to appear healthier than normal. Two consecutive years of plentiful rainfall and limited defoliation contributed to dense, green leaves. However, dieback and mortality occur in forest stands and sugarbushes where stresses have occurred. Hygrading left an unthrifty stand of trees in Newfane, where dieback is high. In a sugarbush in Bethel, a shallow site, past overtapping, and thrips defoliation contributed to scattered mortality. In a Guilford sugarbush, overtapping and sapstreak from logging injuries led to mortality as well. Street trees and ornamentals continue to be in poor condition due to drought, poor site, wounding, and improper planting.

PHYSIOLOGICAL CONDITIONS are thought to be the cause of premature shedding of last year's green needles from white spruce at budbreak. Symptoms occurred on Christmas trees in scattered locations. Affected trees were often genetically related. Similar symptoms were seen several years ago in New Brunswick.

WET FEET was the cause of chlorosis and mortality in white pine stands, which occurred on scattered wet sites throughout the region. Pine engravers were often seen on recently dead trees. Mortality, chlorosis, and frost heaving also occurred to white spruce Christmas trees planted on a wet site in 1989. Several years of above average rainfall contributed to the wet conditions.

WINTERBURN symptoms were widespread, brought on by cold December temperatures follows by warm weather in January. Christmas tree plantations were particularly hard hit. Scots pine, white spruce, balsam fir, and fraser fir were among the species affected. Although new growth developed as normal, some short-needled Scots pine were culled, especially where Lophodermium needlecast occurred as well.

ANIMAL DAMAGE

ANIMAL	SPECIES DAMAGED	LOCALITY	REMARKS
Deer	Many	Throughout	Browse heavy in many locations
Mouse	Hardwoods	Windsor County	Severe damage in scattered high elevation sites. Bark chewed off root collar of mature beech trees on Okemo.
Porcupine	Beech Maple	Sandgate	Damage heavy in places. Elsewhere, very little damage.
Sapsucker	Many	Throughout	Damage more common than usual.
Squirrel	Tubing	Poultney	Heavy damage.

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): ~~Lymantria~~ Gypsy Moth

(SPECIFIC NAME): Lymantria dispar (L.)

HOST: OAK

PRESENT CONDITION:

AREA (TOTAL ACRES): 3882.

LOCATION: Green Mountain National Forest-
2555 Middlebury R.D 1327 Manchester R.D.

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES):

Moderate (31-60% defoliation) - 507

Severe (>60% defoliation) - 945

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

TREND:

PAST TO PRESENT: 1990 was the peak year for the gypsy moth outbreak on GMNF

FUTURE: Expecting the population to decline for 1991.

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

COMMENTS: Suppression project conducted in 1990, 3202 Acres treated on Middlebury RD. Foray 48B(BT) was applied aerially as an undiluted material at 64 oz/A and 24 BIU. Approximate cost was $19.00 per Acre.

- Gypsy Moth defoliation was light (<30%) on the Manchester RD.

- Presence of disease (virus and/or fungus) in the population.

(2)

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Pear Thrips

(SPECIFIC NAME): Taeniothrips inconsequens (UZEL)

HOST: Maple

PRESENT CONDITION:

AREA (TOTAL ACRES): ~~75~~ ~~386~~ 324

LOCATION: Green Mountain Nat. For.

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES):

Severe (>60% defoliation) — ~~75~~ 63 Ac

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

TREND:

PAST TO PRESENT: Pear thrips have not been causing much damage the last 2 yrs. ('89-'90).

FUTURE: Expect that ~~damage~~ will remain low for 1991

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

NONE

COMMENTS:

1990 PEST CONDITIONS REPORT WORKSHEET

PEST (COMMON NAME): Saddled prominent

(SPECIFIC NAME): Heterocampa guttivitta (Walker)

HOST: Beech - Maple

PRESENT CONDITION:

AREA (TOTAL ACRES): 75

LOCATION: Green Mountain National Forest (Bald Mountain)

SEVERITY (INCLUDE ACRES OF MODERATE AND HEAVY DEFOLIATION OR INFECTION; DEFINE CLASSES):

Light (<30% defoliation) - 75

LOSSES (INCLUDE AREAS OF TREE MORTALITY; ALSO VOLUME AND/OR $ ESTIMATES):

TREND:

PAST TO PRESENT: Saddled prominent has continued to stay at low population levels for 1990.

FUTURE: 1991 populations should be similar to 1990.

CONTROL PROJECTS (METHOD, MATERIAL, ACRES, COST, RESULTS):

NONE.

COMMENTS: